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THE TURCO-TATARS.

AN ETHNOGRAPHICAL SKETCH.

By Professor ARMINIUS VAMBERY, of Budapest.

[Read to the Members, in the Library, Monday, January 11th, 1892.]

THE collective name, "Turco-Tatars," includes the southern branches of the nation which inhabit a tract stretching from Turfan and Aksu over Central Asia, Persia, Southern Russia, and the Ottoman Empire, as well as the northern division, which consists of small tribes, and extends from the province of the sources of the Ob and Yenisei to the Lena. Inhabiting an area which, in geographical extent and in variety of climate, is unequalled by the abode of any other of the people of the earth, the Turco-Tatars present now only the detached fragments of a once compact ethnical body—a body which, animated by the restless spirit of a wandering life and a constant desire for adventure, formed the cause of great revolutions among neighbouring peoples, while at the same time bearing within itself the germ of its own division. The collective name, "Turco-Tatar," which we use, is only a scientific term, being a designation foreign to the people themselves, who generally acknowledge only the generic and tribal name, and comprehend in the word Turk much the same sense as the word mankind presents to us. This is indeed quite logical, for the word Turk actually means *Man* or *Creature*. This condition obtains more in the eastern and less sophisticated portions of Islam, for if we ask a Turcoman, Özbek, or Kirghiz of what nationality he is, remarking that he is probably a Turk, he agrees to that as a self-evident fact. And this state of things must be very old, indeed prehistoric. As far as historical memory serves, the ethnical term *Τορχοι* occurs first among the Byzantines, particularly in the report given by

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Zemarkhus of his journey to the Altai Mountains, or Ektag. It was only after coming in contact with this people (partly in the course of missionary journeys, and partly in their conquest of Transoxania) that the Arabs became familiar with the name, as we gather from the report of Ibn Dasta and Ibn Fozlan, as well as from the Tarichi-Tabari and the Tarichi-Narshakhi which appeared later. The first Turkish written authority for the name "Turk," *i.e.*, the Kudatku Bilik, is known to date only from the 11th century, for in this Uigur text the word "Uigur" does not appear at all, while the word "Turk" is frequently repeated.

The name Tatar seems originally to have belonged to that Mongolian — consequently not Turkish — nation inhabiting Eastern Siberia, near Lake Baikal,* who found themselves in the foremost ranks of the Mongolian army in the campaigns led by Djengiz Khan in the west. By this means the Tatars became identified with the genuine Mongols, and the name Tatar came into use instead of Mongol or Mogol in the west and north-west of Asia, as well as the east of Europe. The name reached us in Europe by Russian agency, or, more exactly speaking, by means of the first European travellers, who heard the Mongols called by this name in Russia, where even to-day the same designation is generally applied to Mohammedans. In the Middle Ages the name Tatar or Tartar† was used in Europe in the same sense as Scythian or Barbarian. It may possibly have reached us from Anatolia by way of Byzantium; for, as Sherefeddin states in his "Zafername-i-Timur," a body of Tatars transported under the name of Kara Tatar (Black Tatars) through Helagu to Asia Minor, on the border of Syria, was later settled by Sultan Yildirim Bayizid in the neighbourhood of Ak-Shehir and Kara-Hissar. As these Tatars excelled in horsemanship they were set aside for the service of the Post, and even now the Ottoman name for a post-boy is Tatar. Moreover, whatever the origin of the name may be, this much is sure, we have no historical proof that this ethnical term was ever used by any of the west Turkish peoples themselves, and even the Nogai and Kazan Tatars dislike it and regard it as an insult or a nickname.‡ I do not know exactly in what relation these Black Forest Tatars (between the Katunja and the Bija) stand to the name, nor the Lebed-Tatars (on the Karaköl, in the south of Siberia), some samples of whose literature are introduced by Radloff into the first volume of

* Pritchard mentions the Lake of Bagir in the east of Mongolia.—"The Natural History of Man," I., 207.

† The conversion of the word "Tatar" into "Tartar" is ascribed to St. Louis of France. On hearing of the ravages committed by Djenghiz Khan, he is said to have exclaimed, "Erigat nos, mater, celeste solatium, quia si proveniant ipsi, vel nos ipsos, quos vocamus Tartaros, ad suas tartareas sedes, unde exierunt, retrudemus, vel ipsi nos omnes ad cælum advehant." (Pritchard, "Physical History of Mankind," IV., 278, 332.)

‡ Ostroumon, "Pervi Opit Slovarya narodno-tatarskago Yaziku." Kazan, 1876; p. 10.

his splendid work. Just as little can we tell why Rittich places the Turkish elements of South Siberia under the heading "Siberian Tatars," in his "Ethnography of Russia."*

It follows, then, from what has been said that no ethnically specific meaning is to be inferred from the name Tatar, and that, unlike the collective name Turk, which originated in a misuse of the word, this term applies to a portion of the Turkish nation which has become known in Europe through Russia. This is the only sense in which the designation Turco-Tatars can be used.

I.

Following out our intention of outlining an ethnographical sketch of the Turco-Tatars within the narrow limits afforded by this study, and abiding by the proposed division into northern and southern fractions, we shall turn first towards the north and introduce the so-called Siberian Tatars—first of all the inhabitants of the Altai Mountains and their eastern neighbours. Radloff† very truly remarks that "they have their origin in a mixture of the remnants of races who, driven by circumstances into these mountains, have there become thoroughly mingled with each other. None of these tribes or families are at all numerous, and since they have not been together for very long they present, in spite of their insignificant numbers, a whole series of very distinct differences of dialect. They no longer retain any consciousness of nationality; they know only their family names, or call themselves after the mountains or rivers among which they dwell."

The Altai Tatars live in the district of Büsk and Kuznetzk. in the department of Tomsk, and are divided into (a) Teleuts, or Telengetsas they call themselves; (b) Altai or Oirod and Altai-Rishi (Altai-man) as they call themselves; (c) Shor's, called Kondomzi by the Russians, because they dwell partly in the course of the river Kondoma; (d) Black Forest Tatars, who call themselves also Tuba-Rishi or Jis-Rishi (*i.e.*, woodman), and live between the Katunja and the Bija; (e) Lebed-Tatars, at the mouth of the Lebed, an eastern tributary of the Bija; and (f) the Soyots, upon the slope of the Sayan Mountains. According to Rittich, the latter are an originally Finnish-Samoyedish people, who, having declined from a high state of civilisation, live as rude nomads on Chinese territory on the Karaköl, as Radloff remarks. Besides these, the authors of the "Altaiskago Gramatika" mention the Kumandinzi, or Kumandi-Rishi, as they call themselves, as belonging to the Altai.‡

* Petermann's *Mittheilungen Supplement*, No. 54.

† "Specimens of the National Literature of the Turkish Races of S. Siberia," III., 13. (Translation.)

After the Altai Tatars, let us speak first of the real Siberian Tatars inhabiting the river systems of the Om, the Irtish and the Tobol, who always call themselves Baraba, Tarlik, Tobolik, and Tümellik, according to the government of the district to which they belong, or the geographical position of their abode. Rittich asserts that Samoyedish and Finnish tribes lived here formerly, and that later comers mixed with them, hence the mixture of race evident in their physique. The dissimilarity in their manner of life has to do with the same circumstance, the greater part of them being sedentary and only a small portion nomadic. Exposed as they have been to the civilising influences of the Mohammedans of Central Asia and Southern Russia, the doctrines of Islam have been received among them since the 16th century, the Baraba-Tatars on the Baraba Steppes between the Ob and the Irtish alone being only recently converted, and still retaining many customs of Shamanism. Still further east of the Tom we find the Katchinzi, Sagai, Kizilzi, Koibats, and Karagas in the steppes along the upper course of the Yenisei, in the tract between Krasnojarsk and the summits of the Sayan Mountains, the last-mentioned tribe being found between the rivers Oka, Uda, Birjussa, and Kan.* Radloff ranks along with them also the Beltirs, Kamasinzi, Küeriks, Ketsik, and Tsolim Tatars, who, although altogether few in number, present a very remarkable mixture of Samoyeds, Kalmuks, and Ostyaks, and are now wholly Turkish in their manner of life.

The last branch of the Turco-Tatar race driven away towards the far north is composed of the Yakuts, or, to use their own term, "Sakhalar." They spread from the banks of the mid-Lena, about 60 degrees (lat.) north to the Polar Sea, westward to the Khatanga, and eastward to the Tchuktchee province, 150 degrees (long.) east from Paris. So far it has not been possible to ascertain when or for what reason this Turkish tribe was driven to these inhospitable regions. But there are linguistic grounds for the assumption that the Yakuts have no connection with the Siberian Tatars—that is, they are not descended from them—but that at some very remote period they must have separated themselves from that division of the east Asiatic Turks who inhabited the north of the Thian-Shan long before the birth of Christ, and who are known to us by the collective name Uigurs, or "Turks from East Turkestan." The language of those Uigurs represents Turkish at its oldest and purest, whose wealth of form and expression is scattered through the various dialects; and since the Yakut tongue exhibits certain rules for the transmutation of sounds common also to the Uigurian, as well as a very similar, if not quite

* Schiefner's Introduction to Castrén's "Koibal Karagas Grammar," pp. 5, 6.

identical, wealth of old words and forms, we may venture upon the hypothesis that in ancient times the Yakuts were driven away to the far north, and that since that time they have not come at all into contact with the branches of the great Turkish family between their old home and their present habitation. Only recently converted to Christianity, they still adhere in secret to their former mythology, according to the statement by the Yakut Poryadin, at a meeting of the St. Petersburg Geographical Society on the 5th April, 1877; but they are fast disappearing, and Rittich not untruly remarks: "In the description of these people the ethnographer feels he is writing the memorial of a byegone race. In the embrace of Russia they are fast disappearing."

Regarding the numerical condition of these divisions of the north Turks, we find that, in the work to which we have so often referred, Rittich makes the following computation: In the department of Irkutsk, 1,900; department of Yenisseisk, 20,500;* department of Tomsk, 13,000; department of Tobolsk, 26,592=altogether 61,992 Siberian Tatars, which, together with the 80,000 Yakuts in Yakutsk, gives a total of 141,992 souls.

More than the half of these ethnical fragments of small branches still profess the faith of Islam, while the remaining portion consists of Christians and Shamanists. At least this is the case at present; but in view of the continuous and energetic progress of the Russians it is to be expected that these tribes will soon lose their individual nationality and be swallowed up in Russia.

II.

In order to facilitate our summary, we shall divide the districts inhabited by the southern part of the Turco-Tataric race into a south-eastern and a south-western group, taking as our line of division the Volga and the Caspian Sea—in short, about the 46th degree long. (east from Paris).

THE SOUTH-EASTERN TURKS

include, in the first place, the people of Eastern Turkestan, that is, the Turkish inhabitants of the former, and again present Chinese Tartary, on the southern declivity of the Thien-Shan Mountains, to the region of the valley of the Karakorum range, which slopes down from Shahidullah to Yarkand and Khoten. They are mostly offshoots of the old Uigurs, with a strong admixture of the Uzbek element from Khokand, nomadic

* Schiefner divides the 20,500 as follows:—

Male.	Female.	Total.
635	493	1,128
3,460	3,119	6,579
3,897	4,011	7,908
2,282	2,080	4,362

Consequently a sum total of 19,977 souls, to which must be added 543 Karagas, making altogether 20,520.

Kirghiz and Iranian original inhabitants from the towns. As the Tadjiks and some of the inhabitants of Pamir are included among the people of Eastern Turkestan as well as Turks themselves, it is difficult to specify exactly the number of the latter. Forsyth,* indeed, estimates the sum total in 15 towns of the respective districts at 1,015,000, of which, however, 14,000 are Pakhpuluks and 17,000 Sarigküllis, and these cannot be represented as belonging to the Turkish nation. Therefore, comparing the sum total quoted above with Kuropatkin's† estimate of 1,200,000, we shall not be very far wrong if we place on our list the number of the people of East Turkestan as 1,000,000. This is, of course, exclusive of the 40,000‡ Tarantchis on the Ili, so that the *bonâ fide* natives of East Turkestan may be put down at 1,040,000.

We turn next to the

KIRGHIZ,

who, in numerical strength as well as by reason of a rigid conservatism, represent the greatest nomadic element of the present day. They extend about 400 geographical miles from the Karakorum Mountains northward to the middle Ishim, and in the direction from north-west to south-east over an area no less extensive—from the province of the lower Volga to the river Yarkand; in short, wherever steppes and grassy valleys furnish food for themselves and their flocks. The Kirghiz are divided into Kirghiz-Kazaks and Kara-Kirghiz, also called Burut or genuine Kirghiz, for instance, by Schott.§ The Kirghiz-Kazaks, or Kazak as they call themselves, have often been described, and fall into three divisions—a small, a middle, and a great horde (in Kirghiz, *djüz* = 100)—occupying almost entirely the province between the Jaxartes and the Ural. The other great division, the Kara-Kirghiz, extend from the Semirechensk province over the east of Fergana and Pamir away to the northern spurs of the Karakorum chain. Differing in physique more than in language, these two portions of the Kirghiz seem native to the above-mentioned parts of interior Asia. They are mentioned by Zemarchus, in the account of a journey to the Altai Mountains, as wandering about the same steppes where they are found to-day; for it is only the generic nomenclature, not the home of these people, which seems to undergo changes in the course of centuries, indeed, of ages. "Kirghiz" as well as "Kazak" means literally "Wanderer" or "Nomad," and ethnically is of about the same value as

* "Report of a Mission to Yarkand, 1873" (Calcutta, 1875), p. 62.

† Colonel Kuropatkin's "Kashgaria-istoriko geograficheskoe Oчерk stranii" (St. Petersburg, 1879), p. 25.

‡ In his "Turkestanski Kray" (I., 326) Kostenko admits only 36,265 Tarantchi's. We have accepted Kittich's statement.

§ W. Schott "On the Genuine Kirghiz." From "The Transactions of the Royal Academy of Sciences, at Berlin, 1864." (Berlin, 1865.)

"Turk" = mankind. Hence the Kirghiz-Kazaks were lords of the great steppes north of the Yaxartes long before Djenghiz; they fought under his banner as well as under Timur's; they have even played the part of rulers in the 16th century; till finally they were brought under Russian sway in the course of the last hundred years. At present they are most strongly represented in the provinces of Semiretchensk, Semipolatsk, Turgai, Akmolinsk, Sir Daria, and Aral; and, according to Rittich, they present a sum total of 2,299,366. Kostenko states that 1,462,693 of this number belong to Russian Turkestan, and since the Kirghiz-Kazaks are without exception Russian subjects, this estimate of their numbers may be considered correct.

Respecting the Kara-Kirghiz, it is pretty well known that the Russians became acquainted with them along the upper Yenisei only in the course of the last century, though, according to Schott,* the Chinese had found them there as early as the 13th century. Like the western tribe they have always inhabited the eastern border of the steppes of Central Asia, but with this difference, that they did not despise mountainous regions, but sought out with their flocks the grassy parts of the Altai glacier. As a general rule they also led a more retired life, and did not take part in the world-wide political storms to the same extent as the Kirghiz-Kazaks. The number of the Kara-Kirghiz amounts (according to Rittich) to 324,100, the greater part belonging to the province of Semiretchensk; and since neither the Kara-Kirghiz under Chinese dominion nor those of Pamir are included in this number, we can hardly err in estimating the sum total at 350,000. Added to the Kirghiz-Kazak, this brings the whole number of the Kirghiz up to 3,649,366.

We shall next consider the

TURCOMANS

as a nomadic people *par excellence*, who have always been distinguished by an ineradicable tendency towards a wandering life, and who, as well as the Kirghiz, may be said to have dwelt for ages in the same country that they now inhabit. Their principal home is that region of steppes which stretches from the northern and eastern coasts of the Caspian Sea, along the left bank of the Oxus, in a western and south-western direction, towards the Paropamisus and Hindoo Koosh Mountains, and upon which, as far as we know, there have never been any nomads except the Turcomans. It is, however, not impossible that in ancient times they had a different ethnical designation. As the opinion of the writer regarding the Turcomans has been repeatedly expressed in earlier works, it will suffice at present

* "On the Genuine Kirghiz," p. 431.

to remark that the rough estimate of 1,000,000, which he formed twenty years ago, is to-day shown to be valid, the variation being very slight, and we may very shortly obtain more exact statistical data from the Russians, who are now the governors of the country.

The last of the Central Asiatic nomads of Turkish nationality are the

KARAKALPAKS,

who alone can be shown to have changed their home, driven by political events from their dwellings of former times to the district they now occupy. Nestor mentions them by the name Tschorniklobuk (*i.e.*, Black-hats — Turkish, Karakalpak), as neighbours of Russia, together with the Polowzi Uzi Turcomans. At a later period they governed Kazan for a time, and while in the first half of last century they were still living at the mouth of the Syr, they are at the present time chiefly to be found at the delta of the Oxus, and only sporadically in the district of Zerefshan. In consequence of Russian conquests in that neighbourhood, the colonisation of the Karakalpaks round Tehimbay may be expected before long, for they were always only moderately nomadic, and their splendid herds of cattle hindered any very great movement. In generic relations the Karakalpaks seem to be a mixture of the Kirghiz and Petchenegs, for while in feature they show more resemblance to the Kirghiz than to the Turcomans, their strong growth of hair and beard recalls the description of the Petchenegs given by the Arabs. Their numbers amount to about 70,000; 52,000 belonging to the district of Amoodarja, and the rest to Fergana and the district of Zerefshan.* This concludes our sketch of the nomadic portions of Eastern, more exactly South-Eastern, Turkev; and there remains only the enumeration of the tribes of questionable nationality, some half, some wholly sedentary. Among these we shall first consider the

ÖZBEG,

the really dominating class. Strictly speaking, Özbek must no longer be considered an ethnical so much as a political term, for after its appearance in the countries round the Oxus in the beginning of the 16th century, certain fragments of Turkish nationalities assumed the name, and the real Özbeks population was exposed to one of the fluctuations incident to political events. The inhabitants of Khiva and Bokhara are, therefore, looked upon as genuine Özbeks; while those of the Khanate of Khokand (45,000, according to Kostenko) can no longer be considered such. This very indefinite ethnical con-

* This is Kostenko's statement, more recent as well as more accurate. Rittich estimates 100,000.

dition may easily have led to the identification of the Özbegs with the Turkish-Iranian mixed tribes by some ethnographers, *e.g.*, Rittich, who places the Özbegs and Sarts under one and the same heading, which is certainly incorrect. The great majority of the Özbegs, most of whom live in the country, many being half nomads, inhabit the left bank of the Oxus from Kunduz to Kungrad, and adhere pretty closely to certain genuine Turkish customs, among others to their divisions into families and clans. Only a very inconsiderable number live on the right bank of the Oxus, namely, in Thehri Sebz, belonging to Bokhara, and in Karshi. Just because they belong to the half-independent Khanates it is difficult to give an exact statement of their numerical condition. Rittich is here quite unreliable, and Kostenko can only be turned to account so far that we may record his estimate of 182,120 Özbegs under Russian sway. To this, however, we may add the (approximately) 800,000 Özbegs of Khiva, and about a million and a half in Bokhara and Afghan Turkestan; so we shall probably not be far wrong in assuming the total number of Özbegs to be 2,500,000.

THE KIPTCHAKS,

whose social condition resembles that of the Özbeg, inhabit the north of Ferghana, particularly the district of Endidjan, where they lead a half nomadic life. The name of this tribe, whom Kuhn* ranks among the Kirghiz, must not be confounded with the similar "Kiptchaks"—the Mongolian Empire between the Volga and the Sea of Aral—for this name has an old generic significance, and is still used in its old sense by the Özbegs and Kazaks. Kostenko has estimated their numbers at 70,107 upon official data.

The foregoing tribes represent approximately the purely Turkish elements of Central Asia, or at least the eastern portion of that nation. With them, however, must also be classed the Turkish mixed races, *i.e.*, those which originated partly by the admixture which took place between the Kirghiz-Kazaks and other Turks who had long before been settled there, partly in the amalgamation of the Turks with the native inhabitants of Iran. To the first of these classes belong the

KURAMA,

or Kuraminzi, as the Russians write it, an entirely sedentary people living on the banks of the Tchirtchik and the Angara. Ethnically they are derived partly from the Kazaks, who were impoverished and compelled to settle down, partly from the Sarts, and perhaps also from the Özbegs. To-day they con-

* Alexander Kuhn, "The Province of Ferghana, formerly the Khanate of Khokand" (Russian Review), VIII., 352.

stitute the most industrious portion of the inhabitants of the middle Yaxartes. Their name, Kurama, more correctly Kourama, means mixture in Turkish. Their number is differently stated. Rittich estimates it at 159,500, Kostenko at 77,301, which latter statement seems to us the more likely to be correct, being based upon more recent data, and coming from a member of the Russian general staff in Turkestan.

The next tribe,

THE SARTS,

are distinctly more important, numerically as well as in ethnical respects. They originated from an admixture of the natives of Iran with the Turks in the course of past centuries, for we find the name mentioned as early as in the Kudatku Bilik, with the meaning "merchant." At that time, and even earlier, merchants of Persian, or more exactly, Iranian nationality, came from the country round the Oxus to carry on trade among the Turks, by which means the word Sart came into use later for "tradesman" and "Iranian." It is originally a Turkish word, and, according to its derivation, signifies "to walk, to go to and fro." Therefore, Lach* is certainly mistaken in trying to connect Sart with Yaxartes, or the old Arian Ksatra by an etymological absurdity, for in the face of the Mongolian-Turkish extraction of the word no forcible derivation from the Iranian is necessary. The appellation "merchant" was later generally changed to "husbandman," *i.e.*, non-nomad, and in such a manner as to become identified with "Iranian" or "native."† We have, therefore, in the Sarts a people of Iranian origin with a Turkish admixture, which speaks Turkish altogether; but, at the same time, has retained many traces of its primitive type, unlike its near relations the Tadjiks, who retained the Iranian tongue as well as more sharply defined Iranian characteristics. The Sarts are now most numerous in Ferghana and the southern districts of the province of Sir Daria, where they form about 22 per cent of the settled population. Their total number in Russian Turkestan is estimated by Kostenko at 690,305, and if we add the members of the same race in Khiva and Bokhara the round number 900,000 is easily reached.

In order to complete our description of the semi-nomadic Turks in the south-east of this district, we shall mention finally the

BASHKIRS,

who form the most northerly member of the group we have outlined, and whose present dwellings in the districts of Orenburg, Perm, Vyatka, and Ufa are really on the boundary of

* "Russian Review," 1872, pp. 30-31.

† Similarly the other Turkish designation for the original inhabitants of Iran is Tat and Tadjik, which is derived from tal=peaceful, as has been already mentioned.

Turkey proper, opposite the Ugrian region which begins there. This geographical circumstance explains why the Bashkirs bear unmistakable traces of the Ugrian type, leading to the conclusion that they are an originally Ugrian people who have come under Turkish influence. This supposition is not correct. We must rather discern in the Bashkirs a mixed race of Turco-Tataric and Ugrian descent — essentially Turkish — which, through admixture with the neighbouring Ugrian (probably Ostyaks and Syryans), has acquired certain of their peculiarities without changing its own national idiom (as the Magyar did in ancient times), and whose habitation and language have been invested with a mixed character, in consequence of intimate intercourse, and also, perhaps, of the great number of these peculiarities which have become incorporated. The Bashkirs are mentioned by the earliest Arabian travellers. Formerly they were politically connected partly with Bulgaria and partly with Kazan. In the middle of the 16th century they fell under Russian dominion, and they have only recently begun to lead a more settled, instead of a nomadic life. They are mostly Mohammedans, and their number amounts to about 50,000 souls.

III.

In discussing the third group, *i.e.*, the south-western portion of the Turco-Tataric nationalities, we tread upon ground already so far secure, that Russian government of several centuries' standing, and the proportionally greater proximity of the west, have diffused a stronger light, and the past as well as the present has repeatedly been made the subject of thorough investigation. Here the Turkish element is divided between Russia, Persia, and the Ottoman Empire; and as we mean to travel from north-east to south-west we shall begin with Russia, and, indeed, with the

TATARS

themselves. By this collective name we refer to those Turks who live in the province of Kazan, and have received the name Tatar or Tartarin from the Russians, but who call themselves Muslem or Musulman according to their religion. The entire Turkish population of Southern Russia, composed of the most varied elements, has always altered its constituent parts as well as its ethnical name in consequence of political revolutions, rendering an historical critical classification barely possible; and the Tatar inhabitants of Kazan are in much the same case. The assumption that the majority of the present-day Tatars of Kazan are descended from the former inhabitants of ancient Bulgaria, who withdrew westwards after the devastation of Bolgar and Bilyar by the armies of Djenghiz and Timur, has great claim to probability; although, on the other hand, we

cannot ignore the influx which took place from the south, for during the endless wars and disturbances other elements certainly drifted in this direction. That the mixed character of the Kazan Tatars is strongly marked is then beyond all doubt. At present they are usually divided into Moslem and Christian Tatars. In spite of three centuries' subjection to Russia, the former have only slightly relaxed their adherence to Islam and their Asiatic manner of thought, and there is not the slightest sign of their absorption by the dominant element. According to Rittich, their number amounts to 482,809, and they are upon the whole distinguished by temperance, activity, and rare diligence. Besides these there are the Christian Tatars or Kereshens, as they call themselves, about 27,901 in number, who, forcibly baptised by Ivan the Terrible, were till recently only very lax disciples of Christianity. The total number of Tatars is then 510,710. Finally we shall add here the Mestcheryaks,* that is, that branch of this Tatar type which, though originating from a thorough admixture of the Ugrians with the Turks, yet speak Turkish. They live in the provinces of Orenburg, Samara, Perm, Ufa, and Kazan,† and number about 128,000 souls. Condensing the preceding data it will be found that, from the country of the Bashkirs, *i.e.*, from the boundary of the Eastern Turkish Empire to the farthest north-west point, there are 638,710 people of Turco-Tataric language and descent, mostly Moslems, and generally leading a settled life.

Our statement regarding the generic origin of the so-called Kazan Tatars, *viz.*, that they are descended from detached fragments of former armies which, in consequence of political revolutions, were composed of thoroughly mixed elements and widely scattered, may be repeated with still greater reason when we consider the

NOGAI AND CRIMEAN TATARS.

It is evident from the first of these names that we are here dealing not with ethnical but with political terms. Nogai, of the princely family of the Golden Horde, is known to have been the great-grandson of Dsengiz, his father, Tatar, being the son of Djüdji. Nogai distinguished himself in 1259 in the army sent to ravage Poland,‡ and when, after the death of Batu and the accession of Berke, he was appointed chief commander of the forces, the warriors of Turkish nationality under him assumed his name, in the same way as the Seldjuk, Djugatai,

* Meshtcher is generally derived from the old Russian Matchyar, more accurately Mashar, which is still Mishar in Tartar. This people may be looked upon as the remnant of the former Mesheher (Vetyaminoff-Zernoff, "History of the Kasimides," I., 31). The name Matchar has induced many to try to identify this Finnish-Turkish race with the Magyar, but there is no feasible ground for such an inference.

† In Vol. II. of his "Materials," Rittich gives the number of Meshtcheryaks in Kazan 2,684.

‡ Howorth, "History of the Mongols," Part II., Division II., p. 1,011.

Özbek, and Osman have respectively done. A similar condition influenced the naming of the two chief branches of the Nogai—those of Mansur and Noruz—for it has always been the custom among the Turks to assume the name of a successful and beloved leader as an ethnical name, and thus to identify themselves. It is beyond all doubt that even in earlier centuries the lowlands between the right bank of the Volga and the Sea of Azov were inhabited by this Turkish people. But the different names and the component parts of the individual tribes have undergone changes. Instead of Uzi, Petchenegs, Khazars, and Kumanians of the period between the 8th and the 13th century, we find now Kiptchaks, Özbeks, Nogais, and Kundurs. At present the Nogais, partly settled, partly semi-nomadic, are most numerous in the province of Havropal on the Terek and in Daghestan. Rittich* estimates them at 95,041, and this number added to the other allied Turks of the same neighbourhood gives 120,000 according to Rittich's statements. To these must be added the Crimean Tatars, estimated by Rittich at 80,000, who are distinguished from the Nogais in the east by a greater capacity for culture, and were known as early as the 16th century as an agricultural tribe. They have diminished greatly in numbers, for, according to the census of 1793, there were then in the Crimea 157,125 Tatars, who have decreased to half that number in consequence of continual emigration, thus forming a remarkable contrast to the present increase of the Tatar population of Kazan. In trying to include in these two principal groups—the Nogai and the Crimean Tatars—the Turkish population of Southern Russia from the Volga to the Dnieper, we have, of course, looked upon the smaller fractions, *e.g.*, the Kundurs, numbering 11,000, as belonging to the Nogais, and considered, as a rule, geographical position rather than generic details. In this sense we may estimate the total number of Nogais and Crimean Tatars at 200,000, in spite of these contradictory statements.

We turn now from the south-western province of the Volga to the

TCHUVASH,

who live in the province of Kazan, in the middle course of that river, and form one of the most interesting mixed races of Finnish-Ugrian and Turco-Tataric proveniency. Rittich doubts this, recognising in the Tchuvashes the old Burtas, and assuming (with doubtful accuracy) their ancient home to be on the banks of the Oxus, in the neighbourhood of the Khazar. From there they are supposed to have brought certain Persian customs—for instance, the custom of Noruz—while, as a reminiscence of Khazar, they call Saturday “arnakon” = day of rest

* Petermann's *Mittheilungen*, v. a. o., p. 11.

We cannot agree with this theory. We regard the Tehuvashes as a branch of the old Bulgarians, which at a relatively recent date (7th century A.D.) broke away from the main body of their own race, and became mixed with the Ugrian people with whom they came in contact. Linguistic arguments in favour of admixture with some Ugrian tribe already lost sight of can scarcely be brought under consideration, so slightly is the Ugrian element present in the rich Tehuvash tongue. This language, essentially Turkish, deviates in its system of sounds and forms more than the other dialects of that group, and this divergence has long been a riddle. Still, language forms only one line of ethnological research, and since the delineation of Tehuvash manners exhibits so many traits in common with those of the other Eastern Turks, and since we are unable to identify the Tehuvash with the Burtas of the ancients, we are compelled to look upon this people as a tribe of Turkish descent, who, having abandoned a wandering life at a very early date, have conserved their old national customs longer and better than their southern brethren, and who, along with the Votyaks, Mordvins, and Tcheremises, must first have been reached by Iranian culture after the date of the decline of the power of Khazar. Nominally Christian, the faith of the Tehuvashes of the present retains a large proportion of the old Turkish mythology, and the researches of Sbojew, Fuchs, Zolotniczki, Berezin, and Rittich upon this subject are extremely interesting.

The total number of Tehuvashes at the present day, including those of the province of Orenburg, amount to about 600,000.

Turning from the province of the lower Volga towards Transcaucasia, we must mention the little tribe of

KUMÜK,

or Ghazi-Kumük (*i.e.*, Hero-Kumük), who, interspersed among the Nogai, inhabit the western shore of the Caspian Sea from Sulak to near Derbend. They are a warlike hill tribe, who seem to have submitted to the Russians as early as the middle of the 16th century, and, at any rate, were driven out from the province of Kuban. Rittich estimates their number at 71,968. According to our judgment they form the most southerly branch of the former Pontus and Volga Turks, and differ accordingly from the

TRANSCAUCASIAN TURKS.

As can be historically proved, they first penetrated as far as the Caucasus during the 11th and 12th centuries, on the occasion of Seldjuk invasion of Azerbaidjan, and were again transported thither at a much later date, in the 16th and even the 18th centuries. The date at which the Turkish stream from

the Turanian highlands began to cross Persia in the direction of Asia Minor and Syria cannot easily be determined, for at a still earlier time Turkish auxiliary troops had been sent to the Court at Bagdad. Still the mighty stream broke out first under the leadership of Seldjuk's successors; this sent off smaller streams on every side, and as in the course of time these became more widespread, nothing is more probable than that detached companies from Azerbaidjan should have made their way over the Araxes as far as the Kur. The probability of this inference best becomes clear by consideration of the circumstance that separate Turkish races, *e.g.*, Shahseven, Karapapak, Djanbegli, Inanli, Begdilli, Afshar, &c., are found in different parts of Iran, as well as in Transcaucasia; while others can be proved to have been transported thither under the Sefvevides from the south-east of the Caspian Sea towards the end of the last century. Our supposition that on the road from the Volga to the Caucasus by Derbend, which was so much frequented in the Middle Ages, detached fragments of the Khazan-Turkish populace may have penetrated still earlier as far as the Albania of the ancients—*i.e.*, to the present province of Baku—is not rendered impossible, as N. von Seidlitz* judges it to be, on the ground of the statements of the Armenian chronicler, Kagankatwazi. Still this cannot be proved. The present day Turks of Transcaucasia are very closely connected with those of Iran, and a Khazar descent can relate at the furthest to the Turks of these distant times. The present Turkish population of Transcaucasia is divided among the provinces of Tiflis, Baku, Elisabethpol (Gümri), Erivan, and Kars, and numbers altogether about 900,000 souls, who, in spite of a subjection to Russia of more than a century, have not departed from their religion, manners, or customs in the slightest degree. Socially and ethnically they are connected with the

IRANIAN TURKS.

These are the Turks who inhabit the west, the north, and, sporadically, the south of Iran, and whose immigration dates chiefly from the period of the Seldjukians and Mongols. The Turkish element in Iran, only politically separate from the Transcaucasian Turkish Empire, is most compactly represented in Azerbaidjan, Hamadan, and Khamse; while, mixed with Persian, it appears almost everywhere, the east and south-east excepted. In the first of these places the Turks have long formed the settled population, and only detached races like the Afshars in Urumije, the Mahmudlu in Meragha, the Karapapaks in Solduz, the Shahseven in Ghendje, &c., wander about

* "Russian Review," XV., 218. "Historical-Ethnographical Sketch of the Department of Baku."

as "Ilal" = semi-nomads, in the north-west of Iran. Following up the data of Sir Justin Shiel,* which from an ethnographical point of view are still very interesting, we find Turkish races also in Mazendran (Djanbeglu Imamlu, Usanlu Afshar), in Kerinan (Afshar, Karai), and in Fars, where there seem to be about 40,000 Kashkai tents. The numbers which Shiel gives upon hearsay are quite unreliable, for these "Ilal," dating from the time of the Helaguides and Ilkhanides, singularly enough still hold to the statement of their numbers made centuries ago, which, as I have seen myself, is quite contradictory to the real state of things. In generic relations, as well as in language, the Turks of Iran differ only slightly from each other; and since they do not belong to the real Eastern Turks, but are descended from those who, under Seldjuk, broke away from the north of the Sea of Aral, and are, consequently, integral parts of the former Uzi and Kanglis, so in ethnical relations they form the connecting link between the Turcomans and the Ottomans. It is exceedingly difficult to determine exactly the numerical condition of the Turks of the present day, owing to the uncertain statistical data concerning the population of Persia. In all probability the population of Iran varies between five and six millions, and at least a third of that being of Turkish nationality, we shall not be too daring if we estimate the Iranian Turks at two millions.

OTTOMANS OR OSMANLIS.

This name is here used, not in the collective political sense in which it has recently been employed to denote all the nationalities comprised in the Turkish Empire, but to signify the Turks proper. On the one side they form the most westerly link in the great chain of Turco-Tataric nations, but on the other they have departed further from the national prototype than any other branch of that race, which extends from the extreme north of Asia to Europe.

Whether the Seldjuk chieftain, Suleiman Shah, the recognised progenitor of the Ottomans, led with him 25,000 or 30,000 warriors on his first appearance in Anatolia; whether those of the same race who joined him later brought him a greater or a less number of Turks; so much has been made out and confirmed, that the Ottoman Turks of to-day present the most varied mixture of races imaginable, a curious conglomeration of Arabs, Persians, Armenians, Greeks, Slavs, Caucasians, and other elements, among which only a very small Turkish element is perceptible. United by the bonds of a common faith, the foreign elements have assumed the manners and cus-

* "Glimpses of Life and Manners in Persia," by Lady Shiel (London, 1856). pp. 496-501.

toms, as well as the language of their conquerors; but respecting physical characteristics, even the most daring investigator finds it hard to discern any trace of homogeneity of race. We believe we are right in assuming that only a very small number of the Seldjukian Turkish warriors mingled with the original inhabitants, and exchanged the sword for the plough; for the conquerors always remained true to their old trade, and the majority of the Osmans who labour as husbandmen are descended partly from the natives who came under Turkish influence, and partly from foreign Selavs. This is best proved by the number of Turcomans and Yürüks in Asia Minor (nearly half a million) who have wandered about the province they now inhabit ever since the 14th century, and, favoured by circumstances, still carry on a nomadic existence. Hence it was only in Asia Minor that Islam took firm root and increased. In Europe the sword of the conquerors succeeded in Mohammedanising, but not in making people turn Turks. In spite of a dominion of more than 500 years the number of real Osmans in European Turkey has never exceeded 600,000, while, without agreeing with Ubicini, who gives an estimate of 13 millions, we may allow at any rate 10 millions in the Asiatic part of the empire, most of whom belong to the Sunnites sect, and are to be classed among settled peoples.

If we tabulate the numbers quoted in this hasty ethnographical sketch, we shall find that there are in round numbers about 24 millions of men of Turco-Tataric nationality, about a fourth part of whom must be considered as really nomadic, but the other three parts as exclusively agricultural. The numbers run as follows:—

141,992	.....	Siberian Turks.
1,040,000	.....	Natives of Eastern Turkestan.
2,299,366	.....	Kirghizes.
350,000	.....	Kara-Kirghizes.
1,000,000	.....	Turcomans.
70,000	.....	Kara-Kalpaks.
2,500,000	.....	Özbegs.
70,000	.....	Kiptchaks.
77,301	.....	Kuramas.
900,000	.....	Sarts.
500,000	.....	Bashkirs.
638,710	.....	Tatars.
200,000	.....	Nogais.
600,000	.....	Tchuvashes.
71,000	.....	Kumüks.
900,000	.....	Transcaucasian Turks.
2,000,000	.....	Iranian Turks.
10,000,000	.....	Osmanlis.
<hr/>		
23,358,369		

The overwhelming majority are devoted to the faith of Islam, while a small part hold to Schamanism, and still fewer to Christianity.

Without here entering at length upon historical-ethnographical considerations, we cannot conclude this short sketch without remarking that among the different sections of mankind the Turco-Tatars stand alone as a people who, having played an important part in the history of the world for more than a thousand years, are now almost entirely absorbed by the spirit of Western culture, and must succumb before a fundamental change. The boundaries of the districts appropriate to nomadic life are ever narrowing, and the incessant process of colonisation, going on as it has done for centuries, will attain its end, perhaps, as soon as in the next two generations. The Turkish Empire of the Middle Ages and of prehistoric time will soon cease to be, and none but the faintest traces of it will be perceptible.

Deep-Sea Explorations in the Eastern Mediterranean.—The Deep-sea explorations in the Eastern parts of the Mediterranean, which were continued this year by the Austrian Government, on board the *Pola*, were rich in interesting results; they are analysed by Prof. J. Luksch in the *Sitzungsberichte* of the Vienna Academy (vol. 100, 2nd division), and were briefly referred to in the "Proceedings" for December. Leaving the Adriatic at Cape Leuca, the *Pola* proceeded south to the latitude of Navarino; thence she ran south-east to Candia, visiting also Cerigo Island and Santorin. Sailing round the eastern part of Candia, the *Pola* proceeded to Alexandria, west along the African coast to Ras Milhe, thence to Candia again, along the south-western coast of that island, to Cerigo, Milo, and the Pyraeus. The soundings during the cruise were extremely interesting, inasmuch as in latitude $35^{\circ} 44' 20''$ and longitude $21^{\circ} 44' 50''$ (about 50 nautical miles south-west from Cape Matapan) the *Pola* found the depth of 4,400 metres (2,406 fathoms), followed within a few miles further east by a depth of 4,080 metres (2,236 fathoms), which are the greatest depths recorded in the Mediterranean. They have received from the Austrian Hydrographical Board the name of Pola Deep. The great depression of the Mediterranean must thus be shifted considerably east from its former central position on our maps. Another deep area was explored between Candia and Alexandria—the depths attaining from 3,310 metres (1,810 fathoms) some 20 miles south-east of Grandes Bay, and from 2,392 metres (1,208 fathoms) to 2,120 metres (1,322 fathoms) within a short distance from Alexandria; the maximum depth sounded being 3,068 metres (1,678 fathoms) in $28^{\circ} 39' 30''$ north latitude, and $33^{\circ} 19' 54''$ east longitude. The full results of the numerous and varied observations made on board the *Pola* will be published when all calculations have been completed; but several interesting facts are already indicated in the preliminary report. The highest temperatures were found in the first parts of the voyage, and are given as follows: From $80^{\circ} 8'$ F. to 69° in the first 50 metres (27 fathoms); from 69° to $62^{\circ} 5'$ in depths from 50 to 100 metres (27 to 55 fathoms); from 59° to 57° in depths of from 200 metres (110 to 547 fathoms) to 3,000 metres (1,640 fathoms). The lowest temperature ($52\frac{1}{2}^{\circ}$) was observed at the issue from the Adriatic Sea, at a depth of 760 metres (415 fathoms); at 4,400 metres (2,406 fathoms) the temperature was 56° . It was observed last year that in the Central Mediterranean the density of the water and its saturation with salt increased with depth, and the same was observed in the western part of this year's cruise. But in the Eastern Mediterranean the density of the water varies but very little in the different strata (from 1.0297 to 1.0300), and it is higher on the whole than in the West. The transparency of the water is very great in the Eastern Mediterranean; in three cases a white disc was seen down to a depth of 54 metres (177 feet), but it disappeared from view at a depth of 32 metres (105 feet) at the above-mentioned station in the south-west of Cape Matapan.—*Proceedings of the Royal Geographical Society, January, 1892.*

Shewing Rapids of Medica & Senchey.

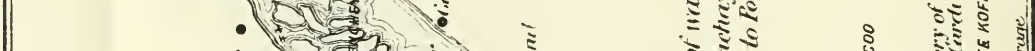


Chart above Osida was not surveyed but
distances &c are put in from report, there
are several rapids between Osida & Yant.
flocks marked with + + are above 10 feet in
height

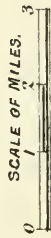
This Chart was made between Feb. 15 1876, and March 3 1876 when the River is at its lowest level.



Koffee Koffie

Depth of Water Measured to Outlet cannot carry more than 12 inches

Depth of water between Aquinnoc and Senechay 40 to 20 feet. - Senechay to Pouq 1 to 10 feet.



A.M.B. Co's Factory
AKUSIE
ACCOON MEDICAL COMPANY
KOFFEE KOFFEE

THE RIVER VOLTA, GOLD COAST, WEST AFRICA.

By Mr. GEORGE DOBSON, of Cardiff.

[Read to the Members, in the Library, January 29th, 1892, at 7-30 p.m.]

IN giving the results of my journey up the River Volta I shall more particularly confine myself to what is called the Upper Volta, viz., that part above the first rapids of Pong. The lower portion is well known, and a considerable trade in palm oil and kernels has been carried on for fifteen years by a Glasgow firm, and before and since by native traders who land and ship their produce at Adafoh through the surf, dealing with English and American traders. The Basel Mission also had a station at Addah, where their mercantile agent did considerable business. Since my time I hear that steamers go into the mouth of the river over the bar. The entrance is obstructed by sand banks, like all the other rivers on the West Coast, the depth of water at low tide being about nine feet. The channel changes very often; in 1875 it cut through the bank three miles to the eastward of its former exit. In 1870 Captain Glover (afterwards Sir John), Governor of Lagos, in conjunction with the Governor of the Gold Coast, ascended the river some fifty miles to Duffia Island to clear out some marauding Ashantees who had settled there, and who were annoying the traders. He surveyed the river. Lieutenant Dolben, R.N., nine years before that had done the same for the fifteen miles between that and Pong. The result of their surveys is the chart furnished by the Admiralty. Landing through the surf at Adafoh is very dangerous, the breakers being higher than elsewhere on the coast. I have been capsized many times, and in 1874 my friend, Mr. Sterling, lost his life from the same cause.

The river banks from Addah to Pong are sparsely inhabited; besides Addah, a town of 7,000 inhabitants near the mouth, there are only seven villages.

Thirty-five miles from the coast is Bato, where the trade road from Krepee to Accra crosses the river, and the chief there demands a considerable toll both for ferry and customs.

At the base of the Pong rapids, and one mile inland, is the trading station Medica. Palm oil and kernels are brought here from the Krobo Mountains, and a small quantity from the Upper

Volta. The greater portion is sent down by canoes or boats to Addah, but the trade is inconsiderable.

Near Assachari, five miles below the rapids, some natives of the upper river were met with, who come there every dry season to gather, and cure by smoking, large shell-fish, the species of which I do not know. At the end of the season they take them back to their own country for barter. What to me seemed very striking was the fact that the whole of the cliff, about forty feet high for a distance of two miles, was quite white for its full height, caused by the roasted discarded shells, attracting attention five miles away.

An abler man than myself would have perhaps told you for how many hundreds or thousands of years this process had been carried on, taking into consideration that the stratified condition of the cliff showed it to be formed of alluvial deposit, and when I was there it was again being washed away by the action of each successive flood season of the river.

At Koffee Koffee we built a dwelling-house and factory, buying land from the chief at a small cost. At Aquamoo a house was bought from the King, and at other places higher up I acquired land and built houses for my agents; the chiefs being only too glad to assist me in every way, of course being paid the usual current rate for labour and materials.

The object of the expedition was to buy the large stock of ivory which was supposed to be laid up in Salagah, some two hundred and fifty miles from the coast, the war between the British and Ashantees having prevented the usual trade from Coomassie being carried on. The caravans coming from the Eastward on their way to Timbuctoo passed through Salagah, or Sarahah, as it is sometimes called, where they exchanged ivory, ostrich feathers, gums, etc., for the Kola nuts which grow freely in Ashantee. Suffice it to say that when my people got to Salagah the ivory had disappeared, leaving only a few worthless Scrivelloes. It had been sent to the banks of the Niger and sold to the English trading steamers, which at that period had ascended the river several hundred miles, and met the caravans with them at Ilorin to the North of Lagos; the Lagos traders also sent to the Gold Coast and had the Kola nuts conveyed by mail steamer. The caravans no longer requiring to make the detour to Salagah, passed a considerable distance to the northward, and thus Salagah, which at one time we were credibly informed possessed, including the travellers, a population in fair time of forty thousand, now has less than twenty thousand. For a fuller description I would refer to a letter from my lieutenant, M. J. Bonnat, which he published in the *Liverpool Mercury* of June 9th, 1876.

My journey up and down the river was in the two dry seasons of February, 1876, and March, 1877, when the river is at its

lowest level. Including the first rapid between Medica and Pong, and one near Yegi, the nearest place on the river to Salagah, there are about sixteen rapids, three of which are in the dry season impassible with loaded canoes, the others only at a considerable risk and also expense of hired canoe-men; a canoe twenty-five feet long by three feet wide and eighteen inches deep, requiring eight men to pole it up. Pong rapid is about four-and-a-half miles long, Senchey two miles, the others being between half and one mile each. At Senchey and Klachie goods must be carried overland for one mile. The most experienced and trustworthy men for this work are the Aquamoos, whose town is about twelve miles above Pong. But it is impossible to get them to go above Chomey on account of intertribal difficulties caused by the Ashantees; the Aquamoos being in 1869 the allies of the Ashantees when the latter made a raid across the east bank of the Volta into the Krepee country, taking prisoners Ramseyer, Kuhne, and Bonnat, who were rescued by Sir Garnet Wolseley in 1873 from Coomassie, after four years' imprisonment. Bonnat's detention there, acquisition of the language, and exalted ideas of the quantity of ivory for sale, was the cause of my entering into this unfortunate expedition.

I had about fifty Kroomen from Garraway when leaving Koffee Koffee, and ten Accramen, with thirty canoes. The Kroomen did very good work, and in twelve years' experience of them in West Africa, I can say they are invaluable, civil and obliging, and when well fed and appreciated, full of hard work, and when properly led, having confidence in their leader, are ready to face great dangers if necessary. At the time of my ascending the river, the Government had wisely prohibited arms and ammunition being landed on the Gold Coast, but by the kind permission of Lord Carnarvon I was allowed a sufficient quantity to protect myself and my people outside the Colony. The payment for each rapid averages one shilling per man and threepence each for subsistence, paid in American trade dollars, which are current up to Chomey. Cowries also are used up to Yegi, the Coast price being 8,000 per dollar, and inland 4000.

At Aquamoo I found the natives unwilling to proceed above Pesse, on account of their being still unfriendly with Quajodey, King of Krepee, though they had held no communications for eight years. I therefore determined to visit Krepee, and, if possible, to establish friendly relations. Landing on the left bank, fifteen miles above Aquamoo, with twenty-five men, two Aquamoos, my interpreter and agent, a nephew of Coffee Calcalli, the deposed King of Ashantee, I started inland, guided by two men from Pesse, who after five miles left me, assuring me that in half-an-hour we should reach Anna, the nearest Krepee village, near which had been in 1869 the residence of the

German Missionaries, Ramseyer and Kuhne, but neither could I find the town, or any sign of it, or any paths.

Three days' hard work cutting a passage through the undergrowth, with only a bunch of plantains for thirty men for two days, and scarcely any water, brought me to Jackai, my pocket compass being of great use. Part of the journey was through high grass, twelve feet high, the decayed roots of which raised the level of our path six feet above the hard ground. I now saw forests of the oil palm for the first time. The other trees I could not name, except the African oak and the bastard teak, called odum, which is impervious to the white ant. I spent the night at Peki, the former capital of Krepee, and sent messengers on to the King, who received me next day at Sokode, twenty miles to the eastward of his old capital. At my request he promised not to molest any Aquamoo in my employ, but more I could not get, as he had not forgotten how the Aquamoos and Ashantees had decimated his country, killing many and taking others to Coomassie for sacrifice.

Krepee extends about fifty miles east to west and sixty from north to south. Its inhabitants number about thirty thousand; the portion to the west being nearly uninhabited owing to the fears of the natives of the Ashantees. What little trade there is is carried on with Quitta and Accra, cotton, palm oil, kernels, and skins being the chief products, the people bringing back salt, cowries, English cotton cloths, hoes and cutlasses for clearing the ground, but not much spirits. In the interior accustomed as I had been to see the vast quantities of rum and gin in the Oil River, I was agreeably surprised to notice all the way up to the Volta, very little demand. The natives make a very palatable beer called "pito" from maize, and of course the ordinary palm and bamboo wine.

Krepee is very fertile, and the people are industrious, though very much more cotton might be grown. The German Mission mercantile agent at Anum was doing a considerable trade in 1869, before the Ashantee war, having a depôt at Ouramadam, one mile above Pong, within the Protectorate. Tobacco grows freely, and especially on the river banks where it has had the benefit of the alluvial deposit of the previous season. The leaf is not cured as in America but it is made into a hard mass, then powdered and mixed with saltpetre to be used as snuff.

From Sokode we went overland in a north-west direction to Bontokoo, on the river, the most southerly port of Krepee, which, however, is of small importance.

From Pong, with loaded canoes, one can get to Aquamoo the same night. After Aquamoo, the island of Adjena is passed, with its groves full of sacred monkeys, black and white. The traveller killing one intentionally, or even accidentally, would be subject to great delay and annoyance. From this point there

is nothing particular to relate of the journey more than the map itself explains.

We went up as far as the cataract of Klachie, sending my people on from there to Salagah, meeting with no trouble from the natives other than their usual delay of "ready to-morrow," which took a long time to come. The adventures at the different rapids may be passed over until we came to Chomey, where a canoe was upset and a great part of my personal baggage was lost, including the rough chart I had made of the river, and my notes up to that period. The villages are few and far between, though there are a few houses at every rapid excepting those between Agenewah and Osuta. The only rivers we saw were two—one of a deep red colour on the right bank, and one opposite Akrosoo on the left bank, the latter one hundred yards wide, the former about thirty.

At the mouth of the former river, opposite Akrosoo, a large slave market used to be held, but when we were there only about a dozen were for sale, the laws of the Gold Coast Government having nearly put a stop to this nefarious traffic; though in justice to the buyers it must be said that the slaves were, in most cases, adopted and treated as children by their new owners.

If it were not that the coast tribes are unhealthy, and do not of themselves increase in population, there would not be this demand for slaves.

We saw no cases of cannibalism, and as far as we could ascertain, human sacrifices are only practised by the two larger nations on each side, Ashantee and Dahomey. At Aquamoo, the chiefs wore bracelets and necklets of human teeth, and the state drum was ornamented with skulls taken in battle.

From Pong to Awrahai the scenery is fine, the hills some five hundred to eight hundred feet high, covered with fine trees down to the water's edge; but on the western side for about ten miles above and below Adjenah it was rather bare.

Above Awrahai the country becomes much more open, with single trees and clumps at intervals, the undergrowth being of coarse grass, which is set fire to in the dry season by the hunters. The only game seen were deer. There are hippopotami the whole way up, which sometimes give considerable trouble to the natives by capsizing their canoes. My people were troubled at night by lions between Yegi and Salagah, but elephants do not come so far south. The average width of the river from Pong to Chomey is one thousand yards, and above that to Yegi about seven hundred yards. The river is narrower in some parts causing the current in the rainy season to run much faster, in some places up to six knots. The average current from January to June between all rapids is about one mile per hour, and the depth is not less than ten feet, except for shoals and islands here and there. In the wet season the river rises prodigiously,

and at my house below the first rapids, where the river is one mile wide, the difference was a height of thirty-five feet, with a swift current, and at Clachie fifty feet.

A steamer, drawing little draught, could leave Addah on August 1st and get right up to Yegi and return before the water fell, and by towing flat-bottomed boats could take up a large quantity of cargo. Palm oil and Shea butter could be brought down by being lashed alongside the steamer and barges in the usual iron-bound casks exported to this country. The trade of the river above Pong amounted in my time to very little, but there is plenty of scope. What kept back improvement then was the fear of the Ashantees, but since their power has been broken by our Government things should be much better.

The King of Aquamoo has jurisdiction from just above Pong to Awrahai, and the King of Krepee from there to Osuta. Between that and Clachie there are a great many small independent tribes, frequent disturbances being the result. The tribes (though there are very few) on the Western Bank at one time paid tribute to Ashantee, but do so no longer. Salagah formerly sent a yearly tribute of twenty-four slaves to Coomassie to be used in sacrifice.

Pagan natives beyond Clachie are called Odonkos, a term of reproach with all the Coast tribes, meaning ignorant or stupid. The Ashantee language, "Ochnee," is understood over the whole of the district, the tribes speaking dialects of it. Krakiedente, or Clachie, is a fetish place, the whole of the surrounding tribes consulting the oracle there, which is supposed to dwell in a rock about twenty-five feet high, two miles inland from Clachie.

Salagah is for the most part Mahomedan. Horses and donkeys are plentiful, and camels are sometimes to be seen. The Coast is not suitable for the horse. I brought ten down overland and not one was alive in six weeks. We were told that Timbuctoo was forty days' journey from Salagah.

One cannot get any good native labour on the river except for the special canoe work over the rapids, but carriers between Yegi and Salagah, twenty-seven miles, are to be had at a reasonable cost, women being the best.

Since the English traders, now merged into the Royal Niger Company, have developed the Niger trade, the importance of Salagah is to a certain extent discounted; but I believe with the late Winwood Reade that the future capital of the Gold Coast will be at the mouth of the Volta. There is very little swamp there and none inland. The country is hilly and consequently healthy. Provisions are plentiful, and fuel may be had for the cutting, and therefore life would be much more endurable there than in any other part of Africa that I have seen between Senegal and the Gaboon.

Whilst in Krepee I made enquiries about the India-rubber

plant. They had not thought it worth anything, but now the exports from the Gold Coast, which in 1882 were only 3½ tons, have mounted up to 600 tons, and are likely to increase.

The Palm oil exported from the Gold Coast should show, for every ton, 2½ tons of palm kernels, yet 80 per cent of these are wasted. Machinery at work on the upper Volta breaking the palm nut ought to pay well.

The Boeme people, latitude about 7°30' N., are workers in iron and copper, reducing both these metals from the ore. Shea butter is only to be had north of 8° latitude, its value being considerably over that of palm oil. Of gold I saw none for commerce. The kings of Aquamoo and Krepeo had their emblems of state ornamented by thin plates of it. I am inclined to think it came from the westward; some is said to be found in Jenne, north-west of Salagah.

The natives of Addah profess that the district north-west of their town is full of gold, but that the country is fetish, and anyone going there would lose his eyesight.

In conclusion, I may be allowed to say that my remarks are necessarily imperfect through the want of technical knowledge. I also lost my notes on the way up, and we came down at so much greater rate that I had not the time to make fresh observations; and after seven years' residence in the malarial district of the Niger delta, I was much more unfitted to take keen observation of things than when I came straight from England.

Porto di Genova, MDCCCXCI. A Monograph by Signor P. Giaccone. Galeati and Son, 35, Cavour Street, Imola. 1892.

This is a handsome monograph prepared for the Palermo Exhibition in 1892. The history of the port of Genoa is given to 1876, when the handsome gift of the Duke di Galliera enabled the Genoese authorities to make a somewhat indifferent harbour into one of the first class. The work contains details of the plans, of the mode of work, and of the completion of the construction. Statistical and commercial information of the port and the littoral forms an important chapter. This noble monograph is handsomely printed and is full of plans, maps, diagrams, pictures of machines, sections of construction, work in progress and finished, portraits and views. A large map of the Genoese littoral, and one of the port with soundings, completes the folio.

La Regularisation des Portes de Fer et des autres cataractes du bas Danube. Report by M. Béla de Gonda. 1892. Paris: Lahure, 9, Rue de Fleurus.

This is a most interesting and valuable report. It is illustrated with photographs, diagrams, maps, geological sections and tables. The report is divided into fourteen chapters, viz., Description of the Lower Danube, Geographical Description of the Lower Danube Country, the Navigation, Roman Work, the Embankments, Szechenyi and Vasarhelyi's work to make the Lower Danube navigable, Wex and McAlpin's plans, the International Commission, the part of the Hungarian Government, and the Methods and Completion of the work. In these days the vast interest of what is practically a great work of canalisation and the circumventing of the Iron Gates cannot be otherwise than of great interest, and M. Gonda tells the whole story with great conciseness and clearness. The whole of the work is expected to be finished in 1895.

THE CONGO: ITS DISCOVERY AND EXPLORATION.*

BY MR. J. HOWARD REED, Hon. Sec., "Victorians."

[Addressed to the Society in the Library, Wednesday, March 30, 1892.]

THE Congo is not only the largest river of the "Dark Continent," but is second only in point of size and volume to the majestic Amazon of South America. It may, therefore, truly be called the largest river of the Old World.

Before proceeding to consider in detail the story of the discovery of this great waterway, the various theories and hypotheses which have at different times been promulgated regarding its source and character, and the many missions of exploration which have, after untold suffering and heroic determination, unravelled its mysteries and made known its geography, I will ask you to glance rapidly at some of the main facts and features of the gigantic stream, in order that we may, at the outset, have thoroughly in our minds the enormous proportions and vast importance of this mighty river.

On referring to the latest maps of Africa we find that the most distant source of the Congo is to be found in the River Chambeze, which rises about midway between the south end of Lake Tanganyika and the north end of Lake Nyasa, at a height of 4,750 feet above the level of the sea. Taking a south-westerly course, this stream flows for some 250 miles, until it reaches a huge depression, where it forms a lake, known to the natives by the name Bangweolo. This lake is about 115 miles long by from 40 to 60 miles wide, with an area of from 6,000 to 7,000 square miles. At the south-west corner of Bangweolo the river emerges, having a width equal to that of the Thames at London Bridge, and flows northward under the name of Luapula. About 200 miles further to the north Lake Moero, with an area of about 3,500 square miles, is reached. From the north end of this lake the river again issues, flowing away generally in a northward direction.

At a point about 200 miles from Lake Moero the river, known from the lake to this point as the Luwa, is joined by another stream of much larger size, which rises some 500 miles to the south-west, and is known as the Lualaba. Both these branches of the main river, from their sources to this point, have, of course, had their volumes greatly increased by the innumerable tributary streams flowing into them from the hills and highlands on either side. The two great rivers are now united into one majestic stream, which, bearing the name of Lualaba, continues its flow in a north-north-westerly direction. A little above the point of junction the river receives, on its eastern side, the Lukuga River, which drains the surplus waters of Lake Tanganyika and its tributaries, and augments the mighty volume of the main river.

When we remember that Lake Tanganyika is 400 miles long, from 20 to 40 miles broad, has an area of 12,650 square miles, and is fed by tributaries which drain about 70,000 square miles of country, we can form some idea of the enormous body of water which is added to the main stream by the Lukuga River.

About 100 miles to the north of where the Lukuga joins the Lualaba, namely, at the Arab settlement of Nyangwe, the main river is more than a mile wide, with a

* For maps to illustrate this paper see Mr. Reed's maps, prepared by him for the Society, Vol. VI., p. 345, and Vol. 7, p. 105.

volume and velocity, according to Stanley, of 230,000 cubic feet of water per second. About 300 miles to the north of Nyangwe are to be found the Stanley Falls, where the river, augmented by the discharged waters of a number of important tributary streams, dashes itself madly down a series of wild rapids and terrible cataracts. These falls extend for a distance of from 60 to 70 miles. From this point the majestic river begins to turn slightly to the westward, and, continuing its course first north-west, then west, and finally south-west—in the form of a gigantic horse-shoe—reaches, after a thousand miles' uninterrupted flow, the open expanse of Stanley Pool. Between Stanley Falls and Stanley Pool the volume of the great river is still further increased by the addition of the waters of a great number of large tributary streams, many of which are themselves extensive rivers, draining many thousands of square miles of territory, and navigable for several hundreds of miles.

Among the great tributaries should be mentioned specially the following: On the north bank the Lindi River, an important stream as yet unexplored; the Aruwimi, noted as the scene of the terrible sufferings of the recent Emin Pasha relief expedition; the Ubangi, or Welle-Makua, which is itself a mighty river, rising away in the "Heart of Africa," and flowing some 1,200 miles before it joins the main stream. On the south bank may be named the Lubilash, or Boloko, navigable for 200 miles; the Lulonga, with its branches—the Lopori and Maringa—navigated for 500 miles by the Rev. George Grenfell; the Chuapa, with its branch, the Busera, up which Mr. Grenfell has also steamed some 500 miles. To these may be added the Kwa, which, with its tributaries—the Lukenye, the Kasai, the Sankuru, the Kwango, and a number of others—adds enormously to the volume of the Congo, and affords some 1,500 miles of navigable water.

The great river from Stanley Falls to Stanley Pool has an average width of some five miles, but in places it reaches as much as sixteen miles wide, and is split up into several separate channels by large islands, with which its bosom is studded. The river, which at Nyangwe had a volume equal to the passage of 230,000 cubic feet per second, by the time it reaches Stanley Pool is swollen to as much as a million cubic feet per second. After passing through Stanley Pool the river ceases to be navigable for about 235 miles—except for one comparatively short break of 80 miles—owing to the angry cataracts known as the Livingstone Falls. Below the falls the river again becomes navigable to the Atlantic Ocean, some 110 miles distant.

The majestic river rushes with such an enormous volume into the open ocean that, for many miles out at sea, its stream can be distinctly traced, and its waters remain fresh, refusing for a long time to become contaminated by the salt of the mighty waste of waters.

The main river and its tributaries have already been explored for at least 11,000 miles. This, of course, gives a length of river banks of no less than 22,000 miles. It can be better grasped what this means when we remember that the whole coast-line of Europe, following every indentation of the shore—from the most northern point of Norway to the spot in the Black Sea where the Caucasus Mountains separate Europe from Asia—is only 17,000 miles, or 5,000 miles less than the total length of river banks past which the mighty Congo continually sweeps. To give another illustration, I may remind you that the circumference of the globe on which we live is 24,000 miles. So that the length of the banks of the Congo—so far as they are at present known—only falls some 2,000 miles short of the total girth of our planet. When the great river becomes more completely known the extent of the river's banks may probably be found to equal, and very possibly to exceed, the earth's circumference.

The total length of the main river—omitting the branches—from source to mouth is close upon three thousand miles, equal to the distance from Liverpool to New York.

The area of territory drained is something over 1,500,000 square miles, or equal, speaking roughly, to about one-eighth of the whole continent of Africa. It exceeds the total area of India by 200,000 square miles, and would only be equalled by 32 Englands. It is needless to quote further figures in order to impress upon us the enormous extent and importance of Africa's greatest waterway.

The wide-spreading arms of the Congo reach themselves out on all sides to such a distance and extent that the remote headwaters, or fountains, overlap and almost intermingle with the streams which contribute their waters to the other great rivers of the continent. On the north-west we find some of the early streams flowing almost from the same sources which supply tributaries of the Niger and the Shari. In the north-east we find the remote tributaries of the Welle-Makua almost touching those of the Bahr-el-Ghazal, which helps to swell the Nile. The headwaters of the Aruwimi, again, flow from within a few minutes' walk of where a view can be obtained of the Albert Lake, also belonging to the Nile system. The Malagarazi River, which flows into Lake Tanganyika, and so finds its way to the Congo, rises in the same hills which give birth to the Alexandra Nile, a western affluent of Lake Victoria. We find, also, many of the great tributaries on the southern bank of the Congo flow from high-lands which also pay tribute to streams flowing to the Zambezi.

In comparison with the historic tales the Nile and the Niger have to tell us, the story of the Congo is only very modern. The early history of the great river is very meagre indeed, and we search the ancient classics in vain for any mention of even its existence.

Until early in the fifteenth century little, if anything, was known of the geography of the West Coast of Africa; but about the year 1412 we find that King John of Portugal despatched vessels to explore the western shores of the continent. One of the younger sons of this king, since known as Prince Henry the Navigator, became an enthusiastic promoter of voyages of discovery, and did much to increase a knowledge of the geography of the globe. Vessel after vessel he despatched, bent on the exploration of the Atlantic coast of Africa, with a view of discovering, if possible, a passage by means of which the ships of Portugal might sail direct to the ports of India. Voyage after voyage was thus undertaken, and discovery after discovery was made, until finally the passage to India round the Cape of Good Hope became a reality. Each new discovery raised the hopes of both promoters and navigators, and led them on to bigger ventures.

In the year 1471 the vessels of Prince Henry reached what we now know as the Gold Coast, in the Gulf of Guinea. King John of Portugal, a few years later, asserted the rights of discovery by styling himself Lord of Guinea, and thus commenced the European partition of Africa which has been so nearly completed during the past few years. On claiming the rights of sovereignty, the king determined to erect, at various points along the African coast, a series of stone pillars as evidences of occupation. The first vessel, bearing some of these stone ensigns of dominion, sailed in the year 1484, under the command of the distinguished navigator Diego Cam.

While following the coast-line, at a considerable distance from the shore, on this voyage, Diego Cam's attention was called to a strong current setting from the land, which was not only of a different colour to the surrounding water, but was, moreover, found to be composed of fresh water. Conjecturing that the current was caused by some river discharging itself in the neighbourhood, the navigator examined the shore closely, and so discovered the mouth of the great river which we now know as the Congo.

The river was, and is to this day, known to the Portuguese as the Zaire, but the actual meaning of the word is doubtful. Some consider it to simply mean river. The country through which the great river flows was known to the Portuguese as the

kingdom of Congo. The Zaire, therefore, appeared upon the early Portuguese maps as *Rio de Congo*, which, when translated, became, of course, on English maps, *River of Congo*, and finally simply Congo, as we now know it.

Although, as we have seen, the mouth of the Congo was discovered by the Portuguese over 400 years ago, very little was known of the geography of the river itself until our own century. Jesuit missionaries certainly settled in the kingdom of Congo, and they doubtless collected much information from the native travellers regarding the geography of the interior. They must have heard of large lakes from which flowed great rivers, but the ignorance of the observers would render the information they conveyed of little importance. The distances of the native travellers would be measured by so many days', weeks', or months' journeys in certain, or, rather, uncertain, directions; but the actual locality, shape, or size of the lakes they would see, and the length, trend, or importance of the rivers they would cross, would be quite beyond their capacity.

The Jesuit missionaries of Congo-land, probably, did not themselves penetrate much more than 200 miles or so from the coast, but they may possibly have reached as far as Stanley Pool, at the head of the Livingstone Falls. They would, however, learn little or nothing beyond this from personal observation. Thus, we find that in the maps of the sixteenth, seventeenth, and eighteenth centuries lakes and rivers, not to speak of towns and villages, are sprawled all over the continent in a most hopeless and indefinite manner.

In the seventeenth century the Zaire, or Congo, is shown as flowing from a lake in the centre of Africa, called Lake Zembre, from which one of the branches of the Nile is also made to flow.

The places on the immediate coast, it will be found, are fairly accurately fixed in these maps; while the general contour of the coast-line and shape of the whole continent is nearly correct. This is, of course, due to the fact that the coast was mapped by navigators who possessed sufficient scientific knowledge to make approximately correct observations; while, on the other hand, the interior had to be mapped from the reports of natives—very ignorant travellers and most unscientific observers.

The English geographer, Peter Heylyn, writing in 1657, speaks of the Zaire, or River of Congo, rising in Lake Zembre. After naming the rivers of the Country of Congo, he goes on to say: "This last (the Zaire), the greatest of them all, if not of all Africk also: Of which, though we have spoke already, we shall add this here, that it falleth into the Ethiopick Sea with so great violence, that for ten miles commonly, for fifteen sometimes, the waters of it do retain their natural sweetness: not intermingled nor corrupted with the Salt Sea-water: Nor can the people sail above five miles against the stream of the Cataracts, or huge falls which it hath from the Mountains; more terrible and turbulent than those of the Nile."

This is a quaint paragraph, but I quote it mainly because of the mention the writer makes of the cataracts. It proves, of course, that the lower river had at least been explored as far as the first cataract previous to 1657.

In the year 1798 Dr. Lacerda, a native of Brazil, under the auspices of the Portuguese Government, made an attempt to cross Africa from the Zambezi to Angola, on the West Coast. He was accompanied by two Goanese, father and son, of the name of Pereira, who had previously reached the country of Kazembe, in the neighbourhood of Lake Moero. The principal object of Dr. Lacerda's undertaking was to ascertain the source of the River Kunene, which flows into the Atlantic on the West Coast, and to determine whether the Chambeze—a river which had previously been reported to exist, by the Pereiras, under the name of Zambezi—flowed to the Shire or to the Kunene; also to obtain information as to the geography of the river previously

reported by the Pereiras as flowing past Kazembe's capital; and further, to quote his own words, "to obtain exact geographical notes of the size and the direction of all streams crossed between Tete and Kazembe's country, and from the latter to Angola." This traveller's journal is a narrative of personal suffering. He, however, reached Kazembe's capital, worn out by fever and anxiety, but died soon after in the neighbourhood, the remnant of his expedition being obliged to retrace their steps to Tete, on the Zambezi.

Between the years 1802 and 1811 two half-caste Portuguese, P. J. Baptista and Amaro José, travelled from Kasanji on the Kwango River, via Kazembe's to Tete, but although each of these expeditions must have crossed numerous tributaries of the Congo, and passed through the countries bordering Lake Moero, little or nothing was added by them to the sum of knowledge of the river, and the lake itself seems to have been altogether missed.

Towards the end of the eighteenth century British enterprise had begun to turn its attention to the Dark Continent, and in the year 1788 the African Association was founded. Many travellers under the auspices of this organisation penetrated Africa at various points, and their efforts added much to our knowledge of its geography. Unfortunately the majority of these travellers ultimately perished, either from the effects of the climate, or the brutality of savage humanity, and thus recorded their names in the long list of those who have perished in the interests of Africa and science.

These various explorers gave their attention principally to the Senegal, the Gambia, and the mysterious Niger. The last-named river had been reached by the intrepid Mungo Park in 1796, but the locality of the mouth through which the river found its way to the ocean was quite unknown. One hypothesis regarding the Niger was that, after a long and sweeping course, it ultimately issued by what was known as the Zaire or Congo. Mungo Park paid a second visit to the upper waters of the Niger River with the intention of floating down with its current until he reached its place of exit. In the year 1805, as is well known, the devoted traveller lost his life in this attempt, when the prize he was striving for was, apparently, almost within his grasp.

The sad and untimely death of the great explorer did much to intensify the desire in Britain for the solution of the Niger mystery, and again the theory of its identity with the Congo was favoured. It was, therefore, considered advisable that a double expedition should be organised; one portion of it to take up the work of following the river to the ocean, from the place where Mungo Park had laid down the task, together with his life; while the other division should commence operations from the mouth of the Congo and work up that river, it being hoped and believed that the two parties of explorers would meet one another somewhere about mid-way.

It is remarkable that in following the history of the exploration of all the great African rivers we find the stories of research overlap one another, much in the same manner as do the wide-reaching branches of the rivers themselves. As we proceed we shall see several instances of this.

The joint expeditions just mentioned were organised and fitted out by the British Government. The Congo portion, with which we have to deal, was placed under the charge of Captain Tuckey, a capable officer of considerable and varied service, and sailed for the Congo early in the year 1816.

Captain Tuckey was accompanied by five scientific assistants, while his vessel was manned by a crew of fifty British sailors. On reaching the Congo the party passed up the river some 110 miles, the progress of their boats being arrested by the great Yellala cataract, and the expedition being compelled to take to the land. After struggling along unknown and difficult roads for many days the health of the party began to give way; so much so that, after travelling some sixty miles—a total from

the sea of about 172 miles—and reaching the spot we now know as Isangilla, they were compelled to turn back. On again reaching his vessel Captain Tuckey found that three of his assistants, who had been obliged from ill health to return to the ship soon after the land journey was commenced, had succumbed. Another one, who only reached the vessel with great difficulty, soon followed them to the grave. Thirteen of the crew also died, and shortly after Captain Tuckey himself fell a victim. Thus ended the attempt of the British Government to explore the river of Congo.

From the time of Tuckey's failure, right down to our own days, no further special attempt was made to explore the Congo, and the various expeditions which in later times discovered the sources and cleared up the mysteries of the great river did not set out primarily with any such intentions. In almost all cases the discoveries connected with the Congo have been the outcome of projects set on foot for other purposes.

In November of the year 1853, Dr. Livingstone left his mission station at Linyanti, accompanied by twenty-seven picked men of the Makololo tribe, among whom he had been labouring. In a journey lasting about six months, and carried through in the face of innumerable difficulties and dangers, with wonderful determination, the traveller followed the Zambesi to its source in Lake Dilolo. He soon after found himself descending the slopes from which spring the early streams of the Kasai River, one of the great southern tributaries of the Congo. Turning his steps westward he directed his course towards the West Coast, and after crossing the Kwango, and other smaller streams, found himself at the end of May, 1854, at the Portuguese city of St. Paul de Loanda. After recruiting for a short time the traveller retraced his steps, and having first seen his followers safely back in their own country, continued his journey with a new party, until he emerged at the mouth of the Zambezi on the East Coast. He had thus connected both the East and West Coasts with the Cape, had crossed the continent from west to east, and earned for himself undying fame as a traveller. This first great journey of Livingstone's not only made known to us the geography of the upper waters of some of the great southern tributaries, for which reason I mainly draw attention to it, but also indirectly led to subsequent researches, which in turn resulted in the unravelling of the Congo mystery.

The reports and map sent home by the Mombasa missionaries, Messrs. Erhardt and Rebmann, in 1855, as is well known, led to the despatch of the expedition of Burton and Speke, which resulted in the discovery of Lake Tanganyika, in 1858. Thus, without any thought whatever of the great river of the West Coast, one of the Congo's great inland reservoirs became known, although it was many years later before the connection was proved or even suspected.

As before pointed out, the great discoveries connected with the Congo have been in almost all cases the result of inquiries set on foot for other purposes, and not the outcome of direct research. This is especially the case with regard to the long and tedious wanderings of Dr. Livingstone, between the years 1866 and 1873, which terminated only on his death in the latter year. When Livingstone started upon his last and greatest expedition in 1866, it was with the idea of clearing up certain doubtful points connected with Lakes Tanganyika and Nyasa, and of establishing, if possible, the southern limit of the Nile watershed. He had no intention of working at the Congo at all, and in fact remarks in his journal, in a half jocular manner, that he had no desire to become "blackman's meat" for anything less than the Nile.

Livingstone landed on the East Coast of Africa on his last journey at the mouth of the Rovuma River, on the 24th of March, 1866. He reached the south end of Lake Tanganyika, known in the neighbourhood as Lake Liemba, on the 31st of March,

1867, having occupied the twelve months' interval in the journey, which was beset by innumerable difficulties and drawbacks, but nevertheless brimful of interest and valuable research. The traveller found himself on a high plateau, while the great lake lay some 2,000 feet below him. After a short rest he arranged to work his way northward, up the western bank of the lake, with a view of connecting his discovery with that portion of the lake previously seen by Burton and Speke. This plan, however, he was obliged to abandon, owing to the unsettled state of the country. Hearing rumours of a large lake further to the west, bearing the name of Moero, he resolved to turn his steps in its direction, feeling sure that it must be in some way connected with the Nile watershed, upon the solution of which problem the whole of his energies were bent.

After numerous delays, due both to the serious illness of the traveller and to the disturbed condition of the countries through which he passed, the north-eastern shores of Lake Moero were reached in the early days of November, 1867. Turning his steps southward he reached the town of Kazembe on the 21st of the same month, passing on the way near to the place where Dr. Lacerda died.

Much valuable geographical information was gathered by Dr. Livingstone from some intelligent Arabs, whom he found travelling and trading in Kazembe's country. He was informed by them that a river bearing the name of Chambeze, which he had crossed while marching from Lake Nyasa to Tanganyika, was connected with Lake Moero upon the shores of which he was then residing. This river he was told flowed through a large lake situated further to the south, named Bemba or Bangweolo, and issuing thence flowed northward through Moero.

After making several minor exploring trips in the neighbourhood of Kazembe's. Livingstone resolved to visit the reputed southern lake. This he was unable to do for some time, owing, in great part, to the refusal of his own men to accompany him. All but five of his attendants deserted the long-suffering traveller at this point. He patiently remarks: "The fact is they are all tired of this everlasting tramping, and so verily am I. Were it not for an inveterate dislike to give in to difficulties . . . I would abscond too."

In spite, however, of the difficulty with his followers, the persevering explorer at last found himself working his way southward, being rewarded for his pains on the 18th of July, 1868, by the discovery of Lake Bemba or Bangweolo. Livingstone hoped to cross the lake to its southern shore, and hired a canoe for this purpose. Owing, however, to the obstinate refusal of his native paddlers to go further, he was able only to reach an island in the lake, known as Mbabala.

Being compelled to give up any further investigation, the baffled traveller retraced his steps northward, rejoined the Arabs, and in their company left the country of King Kazembe; the whole party making towards Lake Tanganyika. The deserters presented themselves again to their master on his return from Lake Bemba, and were readily forgiven by him for their breach of service and allowed to rejoin his caravan.

During all these long and arduous wanderings the health of the devoted traveller had been at a very low ebb. Fever, dysentery, pneumonia, and a number of other disorders had done their work by turns, and brought the gallant hero oft-times to the very verge of the grave. So weak did he become at this period that he was many times quite unable to enter up his journal. He seems to have even fallen at intervals into a state of insensibility, quite losing count of the days of the week and the date of the month. With reference to this period, he writes: "Ideas flow through the mind with great rapidity. . . . I saw myself lying dead on the way to Ujiji, and all the letters I expected there useless. When I think of my

children and friends the lines run through my head perpetually :

'I shall look into your faces,
And listen to what you say,
And be often very near you
When you think I am far away.' "

The Arabs, with whom he travelled, showed him considerable kindness, and by their aid he was carried along day after day in an extemporised kitanda or hammock, often more dead than alive. February 14th, 1869, found their joint caravan on the western shore of Tanganyika, and from here Livingstone took passage to Ujiji, which place he reached a month later.

The wearied traveller had hoped to find awaiting him at Ujiji, a quantity of stores sent from the coast for his benefit. To his chagrin, however, he found that the goods intended for his relief had been either stolen, or expended for their own benefit, by the porters who had been entrusted with their conveyance. A small quantity of tea and coffee, and a scanty supply of flannel had fortunately been preserved among the remnant of the other stores, and to these meagre personal comforts the traveller probably owed his life at that time.

After recruiting at Ujiji, Livingstone decided to travel westward, through an entirely new country, with a view of striking the Lualaba—which we had learned when in Kazembe's country, flowed to the north after leaving Lake Moero—and following it wherever it might lead him. July, 1869, therefore, found him recrossing Lake Tanganyika, and on arriving on the western bank he, in company with an Arab caravan, made his way towards the Lualaba, resolved to :

"Like Douglas conquer, or like Douglas die."

It was March, 1871, twenty months later, before the great explorer beheld the mysterious river. During the interval he had been wandering about, very much at the mercy of the dilatory Arabs, and of his own almost worthless followers, being at one time deserted by the whole of his own party, with the exception of the faithful trio, Chuma, Susi, and Gardner; or for months at a time stricken down with wasting and wearing illnesses.

The point where Livingstone at last struck the Lualaba was in the neighbourhood of the now well-known Arab settlement of Nyangwe, where he found the river "at least 3,000 yards broad." At this point the people in the traveller's service, who had been reinforced by an additional batch sent from Zanzibar, again played him false, and refused to proceed further with their master along the course of the unknown river. Livingstone, baffled, ill and disheartened, was therefore obliged to abandon the quest and retrace his steps to Ujiji, in order to obtain other men.

On this return journey the explorer narrowly escaped with his life, through being mistaken for one of the slave-raiding Arabs who had been carrying on their foul business in the country. The offended Manyemba natives formed an ambush on one occasion, through which the traveller had to run the gauntlet for several hours, only saving his devoted body and head from the showers of flitting spears by the agility he was able to display. Broken down by anxiety and wasted by disease, Livingstone again reached Ujiji in October. He says : "I thought I was dying on my feet. . . . Almost every step of the weary, sultry way I was in pain, and I reached Ujiji a mere ruckle of bones."

The great traveller only reached the Arab settlement to find that he had again been robbed of all the goods which had been sent for his benefit and which had arrived at that place during his long pilgrimage in the cannibal country of Manyemba. A "drunken, half-caste, Moslem tailor . . . had 'divined' on the Koran," found from it that the white-man was dead, and so sold, for his own uses, the goods

which had been entrusted to his keeping. Livingstone writes: "The near prospect of beggary among Ujijians made me miserable." It was when in this condition that the great traveller was found some few weeks later by Stanley, whom he speaks of as the "good Samaritan."

Cheered by the society of the young American, and stimulated by the much needed medicines and nourishments with which he was now plentifully supplied, Livingstone soon regained considerable health and strength, and began to arrange schemes for the completion of his work. Alas! however, the work of Africa's great hero was practically already completed, for after this time it was his lot to add very little more to the marvellous mass of information with which he, by his devoted wanderings, had embellished the map of the Dark Continent!

During the time that the two travellers were associated at Ujiji, they, at the suggestion of Stanley, made a joint journey to the north end of Lake Tanganyika for the purpose of ascertaining whether the Rusizi River, known to exist at that place, was an inflowing or an outflowing stream. This work had been attempted by Burton and Speke in 1858, but without satisfactory result. The Rusizi River had been the sport of theoretical geographers ever since Burton and Speke first made its existence known, and had been made to play the part of an inlet or outlet to suit the constantly varying theories regarding the geography of the lake.

Stanley explained to the Doctor the interest which the problem excited at home, and they therefore decided to make a joint attempt to solve the mystery. Two canoes were accordingly hired, and the travellers embarked on the great lake, directing their course towards the north. On the 6th of December, 1871, the explorers reached the mouth of the river to which their enquiries were directed, and settled once and for ever the question of its flow. The stream was found to be flowing into the lake with a rapid current, and proved to be about ten yards wide, but only some two feet deep. This voyage of exploration also fixed for the first time the north end of Lake Tanganyika.

On returning to Ujiji, after their month's voyage, Livingstone and Stanley commenced a journey in company towards the East Coast, and travelled together as far as Tabora in Unyanyembe. Here they for ever parted, Livingstone shortly after directing his steps towards Lake Bangweolo, only to reach its shores to there lay down his life and his work together.

"The sweet remembrance of the just
Shall flourish when he sleeps in dust."

The aged traveller was not permitted to unravel the secrets of the great river he had discovered, and was never able to grasp its value and vital importance in the work of the opening up of Africa, to which he so nobly devoted his life. We, with the fuller knowledge of to-day, however, are able to appreciate the worth of the determined and unwearying work of the fallen hero, which has stimulated the energies of younger and more recent explorers, and resulted in the almost complete knowledge of the "Old World's" greatest waterway—destined in the future to play so important a part in the development of the Dark Continent!

In February, 1873, Lieut. Cameron left the coast for Central Africa at the head of an expedition organised for the purpose of assisting Dr. Livingstone in the completion of his explorations. The gallant officer was, alas! too late for this, and was fated only to meet the remnant of the old missionary's followers bearing the body of their fallen leader to the coast. Nothing daunted, however, Cameron—although suffering from fever and almost blind with ophthalmia—determined to push on to Ujiji, with the object of rescuing some important papers which Livingstone was supposed to have left there, and in addition to, if possible, settle the problem of the

great river. February, 1874, found him on the shores of Lake Tanganyika, and shortly after he set sail upon the lake for the purpose of completing the survey of its shores. Heading his craft towards the south, Cameron hugged the eastern shore and commenced to map down, for the first time, the features of this portion of the great lake—a truly valuable piece of pioneer exploration. After some weeks of this work, and while sailing towards the north on the western shore, the traveller discovered the Lukuga River. This Cameron believed to be an outflowing stream, although it at the time possessed little, if any, appreciable current, and was, moreover, choked with vegetation. He was assured by a native chief that the Lukuga flowed away to the westward, and, at the distance of a month's journey, lost itself in the Lualaba.

Having completed his survey of the southern half of the lake, Cameron made his way towards the Lualaba of Livingstone, arriving at the Arab settlement of Nyangwe (Livingstone's furthest) sometime in August, 1874. Here the young explorer hoped to be able to obtain canoes, and by means of these follow the mysterious river wherever it might lead him. After suffering considerable delay at this place, Cameron found it was impossible to engage canoes, as he had hoped. At the suggestion of the Arab, Tippu Tib, he decided to visit that trader's camp on the Lomami River, and from there, by a circuitous route, endeavour to reach a reputed lake, known as Sankorra, through which the Lualaba was reported to flow on its way to the ocean. Directing his steps southward, therefore, he soon found himself in a country which had never previously been visited by a white man. He was, consequently, soon alive to the fact that he was the centre of attraction to the motley crowds of natives, who, although at first rather frightened at the strange apparition, soon became confident and gathered round him in inquisitive and gesticulating hordes.

On arriving at the village of Kasongo, on the Lomami River, the traveller found that his hopes of reaching the Lualaba by that route were again dashed. The chief on the opposite side of the river refused to let "strangers with guns" pass through his country. The gallant lieutenant was, therefore, obliged to alter his plans and continue his journey in a southward direction, visiting on the way a small lake, known by the name of Mohyra. Finding himself in a hostile country, the young officer was obliged to take active steps to preserve himself and his men from disaster, but by dint of tact and firmness he was able eventually to safely reach the village of Kilemba. He was there obliged to attach himself to a Portuguese slave-trading caravan, and give up all hopes of again reaching the Lualaba.

Early in 1875 the journey to the West Coast was commenced, and after many delays and difficulties the traveller found himself in August travelling in the neighbourhood of Lake Dilolo, and soon after arrived at the village of Katende—visited by Livingstone many years before.

Cameron remarks upon the manner in which the head waters of the Congo and the Zambezi interlock with one another in this district, and goes so far as to say that "by cutting a canal about twenty miles through a level country they might be connected, and internal navigation be established from the West to the East Coast."

Before the end of the year 1875 the explorer reached the West Coast at Benguela, having, in his nearly three years' journey, traversed several hundred miles of previously unknown country, added much to our knowledge of the Congo watershed, and earned the distinction of being the first European to cross the continent from east to west.

It should be noted that, although Livingstone was of opinion that the great river—upon the geography of which he had devoted such pains—was in some way connected with the Nile, Cameron believed it to belong to the Congo, as was ultimately proved. In his map he shows the Lualaba, taking what he supposed to be its probable course,

straight across the continent, almost due west at about the latitude of Nyangwe, and joining to the then known portion of the Congo at about the point of Tuckey's furthest. It should be remembered, however, that Cameron and others were in possession of facts regarding the altitude and volume of the Nile at Gondokoro, unknown to Livingstone, but which showed conclusively that the doctor's theory was fallacious.

The untimely death of Livingstone, leaving the question of the lower course of the Lualaba still unknown, and several other important geographical problems unsolved, led to much speculation and theorising among geographers at home. Cameron was still buried in the silent depths of the "Dark Continent," and it was, of course, quite unknown whether he still survived, and we were equally ignorant as to what additions he might, if living, be making to the map of Africa.

At this juncture Mr. H. M. Stanley—who had some few years before made himself famous by discovering the whereabouts, and relieving the necessities of the great missionary explorer, and who had, moreover, been led by the influence of his noble friend to take a deep and intelligent interest in Africa and the African—came boldly to the front and accepted a commission at the hands of his former patron, Mr. James Gordon Bennett, in conjunction with the proprietors of the *London Daily Telegraph*. The task set before him was, "to complete the work left unfinished by the lamented death of Dr. Livingstone, and to solve, if possible, the remaining problems of the geography of Central Africa."

Leaving England in August, 1874, accompanied by three young English assistants, Stanley made his way to Zanzibar, and there organised a large and well-equipped expedition, which left for the interior of Africa in the following November.

"Attempt the end, and never stand to doubt;
Nothing's so hard but search will find it out."

It is outside our purpose to follow here all the marvellous journeyings of the explorer, except so far as they concern the geography of the Congo. It must suffice to remind you that Stanley, on leaving the coast, turned his steps towards the Victoria Nyanza, circumnavigated that lake, then journeyed westward and discovered the lake we now know as the Albert Edward Nyanza, and from there travelled southward towards Lake Tanganyika, arriving at Ujiji on May 27th, 1876—nearly two years after leaving England. During this period Stanley had added much to our knowledge of the geography of Africa—only accomplished, however, by persevering and continued effort, untold suffering, and the braving of innumerable dangers by flood and field. During their long and weary wanderings many of the dusky Zanzibari followers had succumbed to accident or disease; two of the English assistants had fallen victims to fever and had found lonely graves in the "heart of Africa;" while the leader himself, as well as his surviving white companion, had had many narrow escapes.

Having arrived at Lake Tanganyika, Stanley at once set off on a voyage of exploration in his boat, the *Lady Alice*, which he had brought with him in sections from England, and in which he had circumnavigated Lake Victoria. He followed the eastern shore of Tanganyika towards the south until he reached the southern limit of the lake, and then proceeded to return northward along the western bank. On reaching the Lukuga River, discovered by Cameron two years before, and which that traveller, as we have seen, believed to be the outlet of the lake, Stanley found himself considerably puzzled.

He had heard of Cameron's discovery, and his theory connected therewith, just prior to leaving Zanzibar, but now that he was actually on the spot he was unable to perceive the slight outflowing current which Cameron had reported. On making

several experiments, by means of floats of different kinds, Stanley could detect no current whatever, and this in spite of the fact that the level of the lake had evidently risen somewhat since Cameron's visit; and since the period of Stanley's previous visit to the lake, five years before, he noticed that the level of the water had risen by many feet, the beach where Livingstone and he used to walk together at Ujiji being covered with water.

On proceeding some four miles further up the Lukuga Creek, Stanley noticed that there was a distinct current to the westward, the intervening distance being choked up by a dense growth of aquatic vegetation, and accumulated débris. Stanley was of opinion that the Lukuga had formerly played the part of an outlet, and was "about to resume its old duties." He says: "When the Tanganyika has risen three feet higher, there will be no surf at the mouth of the Lukuga, no sill of sand, no oozing mud-banks, no rush-covered old river course, but the accumulated waters of over a hundred rivers will sweep through the ancient gap with the force of a cataclysm bearing away on its flood all the deposit of organic débris at present in the Lukuga Creek, down the steep incline to swell the tribute due to the mighty Livingstone."

Stanley's prophecy has since been fulfilled! In 1879, Captain Hore, of the London Missionary Society, visited the Lukuga and found a rapid outflowing current leaving the lake and flowing westwards towards the Lualaba, or as Stanley named it the Livingstone, and presumably onwards to swell the main stream of the giant Congo. Joseph Thomson also visited the outlet at the end of 1879 and he confirms the observations of Captain Hore, and speaks of the current as being so rapid that the natives in the vicinity are afraid to venture into the stream for fear of being swept away in their frail canoes.*

At the end of August Stanley crossed Lake Tanganyika, from Ujiji to the western shore, and after some three days' journey found himself, at an elevation of 800 feet above the lake, on the crest of a ridge which formed the water parting between the streams flowing into Tanganyika and those that flowed westwards towards the great river of Livingstone. Marching day by day north-westward, the traveller followed generally the course of the stream Luama, till at the end of October he reached its confluence with the Lualaba, which at this place is some 1,400 yards wide, and for the first time caught sight of the great and mysterious river. He says: "A secret rapture filled my soul as I gazed upon the majestic stream. . . . My task was to follow it to the ocean."

At Nyangwe Stanley found himself at the point where both Livingstone and Cameron had been compelled to abandon the quest. All ahead of him was unknown ground. The Arabs and natives of Nyangwe could give him practically no information about the country further down the river, but abounded in tales of the savagery and cannibalism of the inhabitants, the ferocity of the dwarf tribes, and the natural difficulties of the region ahead, which only tended to frighten the faint-hearted followers of the traveller and render his difficulties greater. The only information the explorer could gain regarding the great river was "it flows north, and north, and north, and there is no end to it." Stanley resolved—

"To take arms against a sea of troubles,
And by opposing end them."

Tippu Tib, with a strong following of his own people, was induced, in return, for a heavy money payment, to accompany the explorer's expedition for some weeks'

* While this is in the press information has come to hand to the effect that a Belgian expedition has recently traversed the length of the Lukuga River and discovered its point of junction with the Lualaba.—J. H. R.

distance into the unknown countries beyond; Stanley hoping, by this means, to reduce the danger of the desertion of his own people. This plan proved successful, and for days and days the huge expedition carved its way through the dense forests, its members being daily attacked by the fierce cannibal tribes and obliged to defend themselves desperately. After a time Tippu Tib decided to turn back, and Stanley, who by this had managed to collect a flotilla of canoes, resolved to take to the river with the whole of his people and follow it whither it might lead him.

On December 28th, 1876, bidding good-bye to Tippu Tib, Stanley with his boat, the *Lady Alice*, and twenty-two canoes, laden with his followers and goods, began the great and memorable river voyage of some 1,500 miles which first made known to the world the greatest water-way of the "Dark Continent." Daily were they attacked from both banks of the river as they glided down the mighty stream and were continually brought into contact with new, but no less savage tribes, who, sounding their war horns and crying "Meat, ah! we shall have meat to-day," boldly came forward to the attack. Early in January the cataracts, now known as Stanley Falls, were reached, and, fighting desperately for their lives, the traveller and his people were obliged to land and face their savage foes to save themselves from going to certain death over the raging falls. For some three weeks they laboured at cutting a path through the forest and dragging their canoes past the falls, defending themselves at the same time from the persistent attacks of the natives.

Having passed Stanley Falls the great river bore the flotilla along on its mighty stream, opening up to the traveller, day by day, new and important geographical facts, and making known, for the first time, the great bend of the river between Stanley Falls and Stanley Pool, which, in its thousand miles sweep, twice crosses the equator. At the mouth of the Aruwimi River, and again at Bangala, the expedition was attacked in force, but fortunately was able to beat off its assailants. At the latter place they found the natives armed with muskets, the wares of the West Coast trader having evidently penetrated thus far into the interior.

On the 12th March, 1877, Stanley Pool was discovered, and was so named at the suggestion of Frank Pocock, the sole surviving white companion of Stanley. Soon the great series of cataracts, thirty-two in number, and extending for some 230 miles, were reached and named by the traveller, Livingstone Falls, in honour of his fallen friend who had done so much to make known the geography of the upper portions of the great river.

Again the work of dragging the canoes overland was begun, they being taken from the river and, as each succeeding fall was passed, again launched. New canoes were also constructed, and for several months the travellers battled with the difficulties of nature. Many disasters occurred while this work was proceeding, the frail vessels being oft-times swept over the terrible cataracts, many members of the expedition meeting watery graves in consequence. Among this number was Kalulu, the *protégé* of Stanley, who had been previously brought to England and sent to school by his master. Frank Pocock also unfortunately perished in the same manner, owing to his foolhardiness in pressing his boat's crew to shoot a rapid which he evidently thought was less dangerous than it proved to be. His loss, it is needless to say, was a crushing blow to Stanley, who says: "Thirty-four months had we lived together, and hearty throughout had been his assistance, and true had been his service."

The natives were no longer aggressive, but were on the other hand so indifferent to the wants of the travellers that they were within an ace of being starved to death. The villagers despised the East Coast beads and cloth, with which Stanley had paid his way across the continent, and demanded rum in return for their food products. This demand the traveller was of course quite unable to satisfy; consequently as the coast was approached the food available became more and more scanty.

At last in the month of August, 1877, after 999 days' wandering, the remnant of the expedition, in a nearly starving condition, reached the trading station of Boma, on the lower Congo, bearing with them the knowledge that the problem of the mysterious river was solved for ever. Thus "through an Odyssey of wandering, and an Iliad of combat" was the stream of the great inland river of Livingstone followed to the sea, and coupled with the furthest point reached some sixty years before by the unfortunate expedition of Tuckey.

Stanley's great journey from Nyangwe to Boma made known, of course, only the main stream of the river, but it opened the way, and from that day down to the present a whole legion of travellers, both British and European, have devoted themselves to the filling in of the details. The great traveller himself shortly after discovered lakes Leopold II. and Mantumba; and so recently as 1887 explored the great Aruwimi tributary, following it to its source in the neighbourhood of the Albert Lake, when engaged in his last great journey through "Darkest Africa."

The Portuguese travellers Serpa Pinto, and Capello and Ivens have added much to our knowledge of the great southern tributaries of the river, and have increased our information regarding the geography of Lake Bangweolo and district.

The French explorers De Brazza and Crampel have filled in many blanks on the north bank of the main stream in the French Congo district, between the Ubangi and Ogowi rivers. M. Giraud, a young midshipman of the French Navy, very bravely conducted, at his own expense, a difficult and dangerous work in the Bangweolo district. This gentleman in 1883 travelled westward from the East Coast, by way of Lake Nyasa, to the Chambeze River, which he followed in a southerly direction to Lake Bangweolo. This he describes as an immense morass rather than an open lake. After wading and paddling about the swampy district for about a month, he was able to launch his portable boat on the Luapula, which he found issuing from the south side of the lake, and afterwards flowing through a long curve a hundred miles to the south and west before turning north. At the bend, navigation became impossible owing to the existence of a great cataract, and the traveller was obliged to land, in spite of the fact that both sides of the river were swarming with hostile natives, with whom he had for three days been fighting, and by whom he and his boat's crew were unfortunate enough to be made prisoners.

King Mere Mere, into whose hands he had fallen, appears to have almost starved him to death, plundered him of his goods and guns, burnt his matches, and broken his instruments. After two months' galling captivity, however, he managed to escape. He bent his steps towards Lake Tanganyika, suffering greatly, and nearly perishing by hunger on the way. He passed four days in the neighbourhood of Lake Moero, which he describes as a large and beautiful lake, well enclosed with high banks. He found that the Luapula, at Kawende, near Lake Bangweolo, is 295 feet wide, and 16 feet deep. On reaching Tanganyika, the traveller was aided by the Karema missionaries, and after recruiting, made another attempt to reach the Congo. His men then deserted him and forced him to return, and the baffled traveller, like many another before him, was obliged to return to the coast without accomplishing all that he wished.

The German travellers who have done much to fill in the details of the great Congo River are Dr. Pogge, Dr. Von Homeyer, Mohr, Buckner, Wissmann, Kund, Tappenback, Dr. Wolff, Reichard, Dr. Böhm, Muller, and others.

Reichard and Böhm travelled westwards from Tanganyika in September, 1883, and crossing the Luapula entered Msiri's country. They found the river where they crossed about 500 feet wide but not navigable owing to numerous rapids. They

reached the native town of Katapana, and visited Lake Upamba. While in this district Dr. Böhm fell sick and died after ten days' illness. Reichard then attempted to trace the Lufira to its source, but was compelled by the hostility of the Wa-ramba to turn back. Food became scarce, and as the people were unfriendly the traveller suffered many hardships on his return journey. He lived for a time on a scanty fare consisting principally of roots and mushrooms, and almost nightly showers of poisoned arrows were shot into his camp. Where Reichard crossed the Lualaba, just above Lake Upamba, he found the river from 1,000 to 1,500 feet wide, and was informed by the natives that it is navigable to Manyemba.

The most important work of the German travellers was that so ably performed by Major von Wissmann in 1884. This officer, accompanied by Lieut. Muller and Dr. Wolf, travelled inland from the West Coast by way of the Kwanza River. Leaving the river at Malange in July, 1884, they travelled eastward. Crossing the Kwango and continuing their journey, they, three weeks later, reached the village of Mukenge, on the banks of the Lulua. In the neighbourhood a station was established, and named Luluaburg, from which as a base, Wissmann sent his companions to reconnoitre to the east and north.

On May 28th, 1885, the expedition, 200 people in all, commenced the descent of the Kasai in a steel boat, the "Paul Pogge," brought with them in sections from the coast, and a flotilla of twenty canoes, built by them at Luluaburg. On June 6th, the mouth of the great tributary, the Sankuru, was discovered. It joins the main stream in two arms 830 and 1,000 yards wide respectively. Below the Sankuru the Kasai continues its course in a north-westerly direction, reaching in places as much as 3,300 yards wide. After forty-three days' journey with the stream, the Congo was reached, the Kasai being found to join the main river through what is known as the mouth of the Kwa, at $3^{\circ} 13' S.$, and not, as had previous to this expedition been supposed, in the neighbourhood of the Equator.

The Kasai proves to be the largest and most important tributary on the south bank of the Congo, and with its great branch, the Sankuru, explored by Dr. Wolf, adds several hundred miles to the navigable waters of the great river, and opens up an extensive and important district. Since Wissmann's descent of the Kasai, Sir Francis de Winton, with two steamers, has ascended the river from the Congo to Luluaburg.

Among the many English travellers who have assisted to make known the geography of the tributaries of the great river, since Stanley's first descent of the main stream in 1877, the name of the missionary explorer, the Rev. George Grenfell, stands foremost. With the aid of the little mission steamer, "Peace," this gentleman has explored many hundred miles of water-way, and added largely to our knowledge of Congo geography. On the south of the great river he ascended the Lubilash, or Boloko, for some 200 miles; the Lulongo, with its branches, for 500 miles; the Chuapa, and its feeders, for 500 miles; the Lukualli, or Kwango, for over 200 miles; besides several other smaller streams. His most important work, however, was the discovery and exploration, through about five degrees of latitude, of the great northern tributary, the Ubangi. This river, which joins the main stream about half a degree to the south of the Equator, follows, for a considerable distance before the confluence, the same general trend as the main river. In consequence of this fact Mr. Grenfell, when steaming up the Congo along the northern bank, actually ascended the Ubangi for about a hundred miles before he realised that he had left the main stream, and had, unknowingly, discovered a new and extensive river. He followed the new found stream for about 350 miles, where he reached the Zongo Cataracts, which barred his further progress.

The Ubangi has since been proved to be identical with the Welle River, discovered in 1870 by Dr. Schweinfurth, in the "Heart of Africa," when he was conducting his researches in Monbuttu Land. Schweinfurth appears to have believed the river to flow into the Benue and thence to the Niger. Stanley, at the time of his first descent of the Congo, believed Schweinfurth's river to be identical with the Aruwimi discovered by himself on that journey, and it is so shown on his "Dark Continent" map. Dr. Junker, on the other hand, believed the Welle-Makua river emptied itself, by way of the Shari River, into Lake Tsad. This traveller traced Schweinfurth's river westward to a little beyond 23° E. longitude, or to within about 150 miles of the place reached by Grenfell. These two points were also found to be at about the same latitude, so that a shrewd suspicion arose that the new found Ubangi River of Grenfell was really the long known Welle-Makua of Schweinfurth and Junker.

In 1887 Captain Van Gele, an officer of the Congo State, attempted a solution of the Ubangi problem, and with this object ascended the river in the small State steamer "En Avant." The river being at a higher level than when Grenfell ascended it, Van Gele was able, with some difficulty, to drag his steamer past the Zongo rapids, which he found to be six in number, and to extend for a distance of twenty-four miles. This work occupied about twenty days. He followed the river to the east from this point for a considerable distance, but, owing to the hostility of the natives, was obliged to turn back after having penetrated to nearly 22° E., or to within some sixty or seventy miles of the point reached by Junker travelling from the opposite direction. Van Gele found the river at this place to be no less than 7,800 feet wide.

Although for the time-being balked and baffled, the gallant Belgian explorer only retired for a time. The year following he again took up the work. This time he successfully passed the place where he had been compelled to turn back in 1888, and in due time his persevering efforts were rewarded by his reaching the point visited by Junker in 1883. Thus, in the year 1889, did Van Gele establish the identity of the river of Schweinfurth with that of Grenfell. On these journeys Van Gele was further able to add considerably to our knowledge by, also, surveying several of the tributaries which feed the Ubangi.

Many other missionaries and travellers have done much to fill in the minor facts of Congo geography, but it is unnecessary here to go into these.

The present century has been what we may call the age of discovery, so far as the Congo is concerned. The geography of the river is now fairly well known, the discoveries of the past twenty years having undoubtedly transcended all possible expectations or even conceptions. The next century will in all probability be one of Congo commerce and Congo engineering. Already we find a railway, some 250 miles in length, in course of construction, which, when completed, will overcome the natural difficulties of transport in the neighbourhood of the Livingstone Falls, and throw open to the world the mighty natural highway to the heart of the Continent. Already we find, in spite of the difficulties of the cataract region, that some thirty odd steamers are daily ploughing their way up and down the Congo's giant stream. Thus has the great river begun the work of bearing the naturally rich products of the Congo basin to the coast, and of carrying the return commodities into the interior.

The work of the explorer, the trader, and the missionary is already beginning to bear fruit. In their wake will follow civilisation, commerce, and Christianity. Cities—centres of industry and light—will be founded, and in due time the peoples of the "Heart of Africa" will take their place in the progress of the world.

EXPLORATION AND DISCOVERIES IN BRITISH NEW GUINEA
SINCE THE PROCLAMATION OF SOVEREIGNTY.

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WHEN first invited to contribute to the literature of the Australian Association for the Advancement of Science a sense of prior duty to other kindred institutions almost forbade an acceptance. Considering, however, how intimately associated Australian interests are with the development of British New Guinea, and how closely connected the writer has been with the progress of exploration and discoveries made in that territory since it became part of the Empire, it was thought that the Hobart meeting of the Australasian Association for the Advancement of Science would afford a favourable opportunity of placing before the public a brief *résumé* of what has been accomplished on behalf of scientific and commercial geography since the proclamation of sovereignty.

Although but three years have elapsed since Her Majesty's sovereignty was proclaimed over the south-eastern section of New Guinea, the writer knows of no other region in the Queen's dominions, representing the theatre of human energy for an equal period of time, that can be said to have yielded to science and commerce equal results. And these will appear even more remarkable when we consider the limited resources available and the multiplicity of obstacles at all times associated with pioneering struggles in the midst of heathen people and an unknown region.

Her Majesty's sovereignty was proclaimed at Port Moresby on September 4, 1888, and since that date the work of exploration has been conducted without interruption. The first scenes of Sir William MacGregor's operations in this connection were the archipelagos of islands off the south-east shores of the New Guinea territory known as Louisiade and D'Entrecasteaux. For years these islands had been the seat of feudal strife, tribal and intertribal warfare being the chief occupation of the inhabitants.

Public attention was first invited to this part of the Papuan land by the discovery of gold on Sud-Est, and subsequently on the Island of St. Aignan. These goldfields are not extensive, nor have any very rich deposits as yet been discovered, but sufficient has been unearthed to keep a party of diggers employed during the past three years or so. It was chiefly for the purpose of establishing law and order that Sir William chose this part of the possession as the initial point of his administrative labours. The gold obtained on Sud-Est and St. Aignan was alluvial in character. The various islands grouped in this part of the New Guinea waters were found to be of a mountainous character, in some places bold and precipitous, in other parts rugged and broken. Most of the hills, which consist of limestone and slate, appeared to have been early associated with volcanic action. On most of the larger islands traces of gold were found, and some of the creek beds and mountain faces showed strata of quartz and porphyry, and on Normanby Island this formation appeared to be associated with tin deposits. On Fergusson Island important discoveries were made. These consisted chiefly of thermal springs, saline lakes, sulphur vents, and subterranean channels, occupied by drainage water. In some of these cavities the stalactite formations were

observed to be very beautiful. The soil on most of these islands is very rich and fertile. Excepting that cleared by natives for planting purposes, the surface areas are clothed with forest and dense vegetation of less proportions. In several parts the native plantations occupied the steep faces of convenient hills and ranges where regular terraces were cultivated for this purpose. Some of these were subdivided by saplings into small family allotments, great care and attention being bestowed upon their cultivation. The cultivated products consist chiefly of yams, taro, bananas, breadfruit, sugar cane, and sweet potatoes. On the island of Normanby the Chinese banana was for the first time seen growing, as also the sweet potato. Besides ornamenting themselves the natives beautify their dwelling-houses by the cultivation of ornamental plants that grow in the villages. On the whole, these island inhabitants are remarkably healthy. A number of the adult population suffer from the usual forms of ringworm, and jaws are not uncommon amongst the children, but the more malignant forms of disease, such as leprosy, phthisis, fever, ophthalmia, and elephantiasis do not apparently claim asylum with the islanders.

The garment of the sterner sex varies little in design and substance from that adopted by most of the savage races inhabiting the islands of the Pacific; their everyday toilet is not an elaborate one, and their wardrobe is stocked with the long, narrow leaf of the pandanus, that is manufactured into a girdle which is fastened to the waist of the wearer by a cord, sometimes composed of human hair. It was common enough to see their faces smeared with a dark pigment that always tended to increase the natural grotesqueness of their appearance. The women apparently endeavoured to vie with their lords and masters in artistic designing. Not being contented with the simple and easily-varied form of besmearing themselves with pigment, they sometimes have recourse to the artifice of the tattooer. They wear very thick grass petticoats extending extravagantly from waist to knee. Juvenile members of both sexes of the community affect the same form of dress as their elders do. Their domestic animals are limited to the dingo and pig. An abominable practice, which will only be modified as the progress of British influence increases, obtains amongst these people of hunting the heads of their own kind, not merely in times of tribal warfare nor at the dictation of feudal strife, although the latter is by no means uncommon, but the occupation is a recognised one, and to all intents and purposes a legitimate institution fostered from childhood, so that to those concerned the hunting assumes the form of second nature, and no punishment is meted out to the perpetrators.

The skulls are used in dwellings for ornamental purposes, where they are arrayed in conspicuous places according to their order of merit; in some villages the skulls are suspended over the front parts of the houses. Tribal hostilities are common, and it is not unusual to find neighbouring villages so unfriendly with one another that the fear of being killed prevents interchange of civilities. It may easily be understood that the social condition of these people is one of unconstrained savagery, and that Christianity is entirely unknown. Let us hope, however, that the powerful influence of the Wesleyan missionaries, to whom this part of the possession has been allotted, will bear good fruit, and that, instead of reverberating the fiendish yells of the heathen war-cry and feast, the hills and valleys will henceforth re-echo the melodies of Christian harmony. The civil law is administered by a resident magistrate, and a gold warden, whose headquarters are at Samarai, in the Louisiades.

To the north of these groups lie the remote islands of Trobriand, Murua, and Nada, occupying a position between the parallels of 8deg. 25min. to 9deg. 23min. south latitude and the meridians of 150deg. 30min. to 153deg. 40min. east longitude. These were visited and explored by Sir William MacGregor in July, 1890, and subsequently the central group of Murua was the scene of His Honour's operations when

its physical conditions and resources were more widely investigated than on his former visit. Nada is the name applied to the most easterly of these islands, the whole being only a few feet above high water level. In this and the neighbouring groups to the westward are several secure harbours. While some of the islands are covered with excellent soil, admirably suited for the production of all the varieties of native food, the inhabitants of others are obliged to obtain supplies from indulgent neighbours. The dwellers are of Papuan type, active and intelligent. For arms they use the spear, shield, tomahawk, and knife; stone instruments being superseded by the more modern article from the blacksmith's forge. In dancing they are remarkably clever in the performing of graceful movements with the shield. They carve wood and devote much time to fishing. The fish are caught in very large quantities, and cooked in wide-mouthed clay pots. In disposition Sir William found the islanders friendly and eager to trade. The Murua group, nearly half a century ago, witnessed the first struggles of the Marists, in the noble and self-sacrificing cause of Christianity. The record will be found in the history of the first Melanesian French Catholic Mission, of the disheartening trials of these messengers of the Gospel of Christ, and of their fruitless efforts to Christianise a refractory and freedom-loving tribe of Papuans. It was while in this offshoot of the possession that the opportunity was embraced of extending our hitherto imperfect knowledge of the north-east coast of the New Guinea mainland, which is limited by East Cape on the east and Cape Ward Hunt on the north-west. It may be as well to state that since the visit of the late Sir Peter Scratchley, in the "Governor Blackall," the promontory forming the common coastal boundary of the German and British spheres has been known by the name of Boundary Cape, but that the old appellation has been reverted to by Sir Wm. MacGregor in deference to the wish of the Hydrographer to Her Majesty's Government. In general aspect the north-east coast is wild, lone and weird, the mountain ranges being steep and rugged in most places, their flanks and leading spurs washing themselves in the limpid waters of the Pacific. No spacious harbours are to be found here, nor do the waters of the coastal slopes find their way to the sea by deep and wide river channels, such as those on the opposite side. To conduct a detailed survey of this part of the territory would require prolonged professional labour, but nevertheless many important discoveries were made, and the details brought to light of that which formerly was very imperfectly known. An active volcano was discovered in the crown of Mount Victory, and several important features in the coastal formation were revealed. This part of New Guinea was some time ago associated with an unhappy occurrence, one of the native villages being entered and plundered of its store of ethnological objects, comprising implements of warfare and domestic utensils. But it will be gratifying to all true lovers of science and humanity to learn that one of the chief objects of Sir William MacGregor's visit was for the purpose of restoring these stolen articles to their rightful owners.

Generally speaking the coast line apportions itself into three great indentations known by the names of Goodenough, Collingwood, and Dyke Acland Bays respectively; of little importance, however, to maritime enterprise as shelters to the traders, cruisers, or the more spacious ships of Her Majesty's Navy. The coastal waters being studded with hidden dangers are not favourable to navigation nor attractive enough to induce pleasure seekers to risk life and property in obtaining further information of their natural conditions. The general aspect of the coast is, however, somewhat modified as the Anglo-German boundary is approached, where fertile valleys and open plains are at places met with. In some parts the country bordering upon the sea shore is swampy and the soil sour; but this is by no means a characteristic feature, nor one likely to impede settlement. A remarkable feature

in the coastline is the absence of even moderately sized rivers. A glance at the general topography of the country shows there is no drainage of sufficient magnitude to create rivers of any importance. In character the vegetation of this region assumes no remarkable features, the foreshore being fringed with the usual ever-green mangroves, and the background clothed with the weird casuarina and the ordinary forest trees. In the congenial swamps the sago palm grows, and the majestic wavy head of the cocoa-palm towers over all other forms of vegetation. In the neighbourhood of villages, where these grow in clusters, the aspect of the landscape is transformed to one of loveliness. Cape Nelson is chiefly noted for the numerous indentations, forming very picturesque harbours of refuge for coasting vessels. These occupy the whole perimeter of the cape, and are separated one from the other by long narrow tongues of land with the central ridges of moderate elevation. In the neighbourhood of these picturesque havens the country is thickly inhabited by people who cultivate the soil profitably, and who utilise the fringing reef for fishing purposes. It is over this part of the possession that the Anglican mission influence is now being extended; its territorial limits embrace the whole of the country between the Anglo-German boundary and Cape Ducie, where the Wesleyans join. It is only natural to expect that over such an extensive coastline the variations in the general characteristics of the native inhabitants should to some extent be correspondingly great. In many places where no previous intercourse with Europeans had been held the people were friendly and confident, but outside those virgin fields shyness and distrustfulness were rampant. Some of the men wore false whiskers from ear to ear, their hair assuming the form of great mops and matted ringlets. Their ears were embellished with rings of various shapes, and their heads were decorated with feathers, shells, and fibre. It was somewhat remarkable that in the more westerly tribes a corset of net work was worn by the women, and to the east of these the men wore a similar garment. Of iron and other European articles of merchandise, most of the coastal tribes knew nothing, nor were persistent practical demonstrations of their utility sufficient to induce them to view with favour what other neighbouring tribes would not hesitate to possess themselves of by murder, rapine, and plunder. In design and structure the dwelling-houses are similar over the whole of this region; their capacity is no larger than the immediate wants of each family require, and for domestic purposes they are inferior. An interesting feature was discovered in the neighbourhood of Cape Sebiribiri, consisting of a natural stronghold of probably 80ft. in height, composed of two huge masses of coral with perpendicular faces. The culminating parts of these were occupied by several houses to which access was obtained by wooden ladders. The eastern portion of this part of the possession witnessed the enactment of one of the most horrible tragedies ever perpetrated within the district. This occurred in Chad's Bay a few years ago, when the *Star of Peace* was pillaged and her captain, Ansell, brutally massacred. The inhabitants proved themselves remarkable for their warlike disposition and refractoriness after the deed had been perpetrated. Occupying an advantageous position they succeeded in eluding the Administrator who at first occupied their villages, and subsequently Ansell's Peninsula, for several weeks. Sir William's movements, although wisely planned and skilfully conducted, were closely watched and aggravatingly evaded, and it was only by the aid of friendly disposed chiefs that the capture of Ansell's murderers was eventually effected.

The eastern districts embrace the country between Port Moresby and East Cape. Part of this territory was known before sovereignty was proclaimed, but it was not until Sir William MacGregor's official duties took him on extended tours of inspection that we were able to obtain reliable information concerning the geographic character

of the whole section, and the social conditions of the inhabitants. Of the former it may be said that in quality the same variety exists throughout that is met with in other parts of the possession. The basin of the Kemp-Welch River comprises some fine agricultural and pastoral land, most of which, however, is occupied by native dwellers. Vegetation is luxuriant, the conglomerate faces of the Astrolabe Range, and its outliers are mantled by dense forest, and the lower ridges and flats are interspersed with patches of grass and timber trees, among which the well-known eucalyptus flourishes. The limestone hills are carpeted with nutritious pastoral grass, and the intervening valleys embrace soil of very rich quality. In the immediate neighbourhood of the seashore the country is thickly populated by a variety of tribal communities, but in the inland districts the people are scattered. For this reason much larger areas of country are unoccupied than in the more thickly settled coastwise regions. The inhabitants are divided into tribes, some large and others very small, but all more or less hostile to one another; consequently they are rarely at peace. From incessant incursions some formerly powerful tribes have been almost entirely exterminated, the remnants living a miserable existence in tree houses. This is notably the condition of the wretched Veiburi and Seme people, who for years have been persecuted by the hostile tribes of Manukora and Garia. Not satisfied with repeated assaults upon inferior numbers of men the Manukora savages were eager to take advantage of poor defenceless women and children. A most painful case of this kind was investigated by the Administrator shortly after his assumption of office. It was on the peaceful bank of a mountain stream that a native woman, accompanied by two little girls and a boy, were innocently wandering in search of food when they were brutally slaughtered, and their ghastly corpses left on the gravelly edge of the stream to the ravages of the birds and beasts of prey. Their forms of disposing of the dead are loathsome and repugnant to the civilised mind. In some places the remains are laid out on an unprotected platform, where the elements are free to act on the fleshy substance. Sometimes the corpses are suspended in the branches of trees in a position to allow the decomposed liquid to fall in a vessel, and others are laid out on platforms inside "dead-houses" within the villages. Upon the individual merits of these systems it is not intended to dwell; let us hope that as civilisation advances these outrages upon the feelings of the living may be recorded as a thing of the past. The process of transition will no doubt be slow and even tedious, but if the foundation we have already laid is steadily built upon the issues will be felicitous.

One of the earliest Government stations is situated at the village of Rigo, where the interests of the Crown are protected by a resident agent. This is not far distant from the seat of Government, but the site was an eligible one, and easily accessible either by land or by sea. One of the native teachers of the London Missionary Society also labours in this district, his head quarters being also at Rigo. Concerning the geological character of this region we know but little. Several specimens of rocks have been submitted to the practical examination of experts, but the conclusion arrived at indicates the absence of adequate representation. The specimens were chiefly pebbles and small pieces of quartz, jasper, lydionised quartz, limestone, and oxide of manganese in a hard and silicious matrix. In the district of Rigo indications of iron were met with, and specimens of plumbago of good quality were obtained. From his hurried observations Sir Wm. MacGregor is of opinion that these plumbago deposits, which are scattered over wide areas within the district, may very probably be of considerable commercial value. The Kemp-Welch basin is walled in on its northern aspect by Mount Obree, the highest peak of an extensive and rugged range, the slopes of which are clothed by dense vegetation. To scale this mountain peak was the ardent ambition of many an aspiring and adventuresome mind. Expe-

ditions were organised which traversed the Kemp-Welsh Valley, but it was not until Mr. Cuthbertson arrived on the scene that its mysterious resources were brought to light. This explorer, who was the emissary of the Royal Geographical Society of Australasia, very pluckily succeeded in reaching an altitude of about 8,000ft., where surrounding objects were rendered difficult to observe by a dense curtain of fog. Although Mr. Cuthbertson, from his position, was able to observe the peak of Mount Victoria, on the Owen Stanley Range, and to obtain a good view of the surrounding range, it is still a matter of doubt with some whether points of a higher position on the Obree range might not have been hidden from view by one of the numerous mist columns which so frequently obscure the subalpine zones of the mountain. When Sir Wm. MacGregor first visited this district the people inhabiting its most easterly aspect were more warlike than those nearer the seat of Government. This was especially the case with the Cloudy Bay natives, who were associated with one of the most horrible tragedies ever witnessed in Papua—the massacre of Rochefort and MacTier. Arriving in Cloudy Bay these two men, in quest of gold, were brutally murdered when in the act of crossing a small stream. When some time afterwards Sir Wm. Macgregor was on an expedition to the locality, he saw fragments of the skulls of the wretched victims to savagery lying on the bank of the stream. The villages of Merani and Isimare, situated on the Domara-Wai, a small stream flowing into Cloudy Bay, were fortified by strong palisades and tree houses. The soil of the locality is very rich, the cultivated products plentiful, and the vegetation most luxuriant. Overlooking this district are Mounts Suckling and Clarence. The former, some 11,000ft. above sea level, was ascended by the Administrator, and an exploration of its neighbourhood conducted. As the result of these operations several new birds, and other objects of interest were added to science, and fresh accessions to our hitherto limited knowledge of the geography of the region made.

From a geographic standpoint the central and western divisions have yielded a more plentiful harvest during the period over which these remarks extend than probably any other part of the possession. The extension of our knowledge to the culminating peaks of the Owen Stanley Range alone enriches our resources incomparably to a far greater extent than any previous or subsequent effort in the field of exploration. With no elaborate or pretentious preparation Sir Wm. MacGregor, with a mere handful of followers, most of whom were unacquainted with the forms of higher civilisation, set out in no statelier a yacht than an ordinary whaleboat for the Vanapa River, where it was thought an easier means of access to interior regions might probably be discovered. For that purpose the Vanapa River seemed suitable. Struggling heroically with the rapid current of the Vanapa they succeeded in covering a distance of forty miles. River transport from this point being no longer possible, the remainder of the upward journey lay over dangerous creeks, almost inaccessible precipices, and rugged precipitous mountains. It is only to a few—a very few indeed—that the actual conditions under which this expedition laboured are known. In the most difficult positions, and at the most critical moments, when Papuans and Europeans alike were unable to either advance or retreat, Sir William, at the imminent peril of his own life, led the way, forcing formidable obstacles to yield, his actively and skilfully-wielded knife clearing the dense brushwood that almost defied penetration, and even positions where his followers were transfixed in amazement were not enough to repel him. From the dépôt on the Vanapa to the top of Mount Knutsford the strength of the expedition did not suffer diminution; after this point was reached Sir William was obliged to continue the journey, accompanied by only a few coloured followers. On Mount Knutsford they

passed through a region of dense fog, the upper limit of which was marked by a dense growth of slender bamboos. Associated with the continuous dampness of the fog zone was a most luxurious growth of moss, which appeared to insinuate itself into and over everything. To the trees it invested them with almost dismal aspect, and this was rendered all the more intensely dismal by the entire absence of animal life. Not a sound, not a whisper broke the painful silence of the lone surroundings. From the bamboo zone upwards the climate was magnificent, the atmosphere dry and bracing, and the temperature at mid-day in the partial shade of the forest not exceeding 60deg. or 70deg. Fahrenheit. The rocky peaks of Mount Knutsford were crowned with an Alpine flora, which also flourished at a lower altitude within the highest zone of the mountain. The clouds of this region were apparently motionless, their upper stratum being like an Arctic landscape of dazzling whiteness. Diorite and crystalline micaceous schist represented the geological conditions of Knutsford's summit and base. It was noticed that after 10 a.m. the regions below the summit of this mountain were entirely obscured by dense vapour. Before that hour an extensive and magnificent view of the whole southern coastal slopes could be obtained, the sinuosities of the Vanapa could be traced, and the great physical features of the country followed without effort. Advantage was taken of the position by the leader, who executed a topographical sketch of the representative heights. Following along the course of Mount Knutsford, they descended to and crossed the Vanapa at an altitude of 10,130ft. above sea level. Renewing the ascent of the central spur of the Owen Stanley Range, across the river, they reached Winter's Height at the 11,832ft. level, from which to the summit of the great range was comparatively but a step. A cypress forest mantled Winter's Height, and the howling of wild dogs was the only sound that broke upon the awful silence of the stupendous Alpine region. From the top of Mount Douglas strawberries were obtained, and the summit of the range disclosed a great variety of grasses, daises, buttercups, forget-me-nots, and heaths. On attaining the culminating eminence of the Owen Stanley Range, upon which Sir William bestowed the illustrious name of our gracious Sovereign Queen Victoria, it was discovered that the crown of the mountain was composed of six separate peaks, with a common base. The peaks occupying the extremities were scaled without difficulty, but those of intermediate position, being composed of bare precipitous rocks, were ascended only with very great difficulty; indeed, it was while in the act of climbing one of these that the leader of the expedition nearly forfeited his life. In the daytime the atmosphere was clear, dry, and bracing; the nights were cold, and the early morn dawned upon a region white with frost and jewelled with long icicles. At midday the temperature in the sun was 70deg. Fahr. on the top of the highest peak. The unique views from the peaks of Mount Victoria were most remarkable.

"A glorious vision burst upon their sight,
As on the topmost peak they took their stand,
To gaze from that clear centre on the world,
And measure with their proud delighted eyes
The vast circumference, whose radius stretched
Seaward and landward, each forty miles.
Beneath their feet a burnished ocean lay,
Glittering in sunshine."

Far away on the one hand lay the mysterious shores of the north-east coast, and on the other the dotted waters of Torres Straits, with its numerous islands and coral patches, while far away to the northward appeared the stupendous heights of Mounts Albert Edward, Scratchley, Parkes, and Gillies, so named by Sir Wm. MacGregor. The rock specimens obtained from this Alpine region pointed to its limited geological

character, chrystalline micaceous schist being abundantly represented. Formerly geographers had thought that the Owen Stanley Range comprised the whole unbroken mountain chain extending to the south-eastern peninsula, but the observations of this famous expedition demonstrated the existence of the disunion between Mounts Victoria and Obree, which renders the recognition of a distinction between the two mountain masses necessary.

One of the first divisions of the British possession is the Saint Joseph district, bordering Hall Sound, and overlooked by the highlands of the Kovio Range and Mount Yule. Watered by a fine stream, the basin of the St. Joseph River is luxuriant in vegetation, rich in soil, and opulent in cultivated products, among which the taro flourishes in great abundance. The district has been extensively explored by Sir William MacGregor, and the conditions of the native inhabitants investigated. At the close of 1890 the Kovio Range and the summit of Mount Yule were successfully explored by the expedition of the Victorian Branch of the Royal Geographical Society of Australasia, commanded by Mr. George Belford, an officer of the New Guinea Government, under whose auspices the expedition was conducted. After personally directing its organisation, His Honour the Administrator accompanied the party for some distance inland in the St. Joseph district, and after conducting the explorers to its base, he left them to accomplish the ascent of the mountain, which was reached on Christmas Day. Formerly, it was thought that Mount Yule occupied a similar position to the Kovio Range that Mount Victoria does to the great mountain mass bearing the name of Owen Stanley. It appears now, however, that former views require modification to the extent of recognising this great physical feature as an independent isolated mass shot upwards from the lowlands of the St. Joseph district. This circumstance may somewhat account for the volcanic character of the mountain. The expedition in passing through a schistose country met with traces of gold. The Kovio range is forested to its summit, and on its slopes and outliers numerous native tracks and villages exist. From these and other indications of life it was supposed that the country is occupied by a numerous population. The expedition experienced wet weather, and met with few forms of animal life.

FLY RIVER.

About the end of 1889 Sir William MacGregor commenced the ascent of the Fly River in a steam launch and two whaleboats. In this he was accompanied by a party of eighteen, including Europeans, Papuans, and other coloured men. The influence of the tide at 150 miles from the river's mouth appeared to altogether cease. After passing through low, swampy, and uninteresting country, the junction of the Fly and the Strickland Rivers was reached; this was named after Captain Everill, who commanded the expedition sent out by the Royal Geographical Society of Australasia in 1885. Stones and pebbles of quartz were met with for the first time at 486 miles from the mouth of the river. At a place called Lario Bank, so named after one of the members of the expedition, who received an arrow wound from a party of aggressive natives, good indications of gold were obtained by washing the gravel in a tin dish. Some 523 miles up the Fly, long and dangerous rapids were encountered, the river bed was found occupied by sand spits, islands of small stones, pebbles of granite, limestone, conglomerate, quartz, slate, basalt, flint, petrified wood, coral, and shells. In latitude 5deg. 58min. south, some 535 miles from the river's mouth, the limit of steam navigation was reached. From this point the journey was continued in the whale boat, which was dragged through the rapids by a rope. Two new streams were discovered and named the Palmer and the Black rivers respectively, in honour of

Sir A. H. Palmer and the Hon. M. H. Black, of Queensland. After traversing some 590 miles of the river, a splendid view of the Victor Emmanuel Range was obtained about from 35 to 40 miles away. In this section of the river traces of gold were also found. The general physical character of the country consisted of low forest-clad sandstone hills, ranging about 300ft. high, the trees being similar in character to those common to the lowlands of the coastal regions. The exposed face of the high banks of the river disclosed a seam of lignite some 6in. in thickness, but of no value for commercial purposes. As numerous snags rendered further progress by boats impracticable without examination of the river, a fortified camp was constructed on the bank of the Palmer, some 600 miles from the mouth of the Fly River. Here the shade temperature was 90deg. at mid-day, and 74deg. Fahr. at night. Traces of fine gold were found here also. Two Polynesians and one Papuan were placed in charge of the 600-mile camp, and the remainder of the party proceeded in the whaleboat some 14 miles further up the Palmer River. From this position the Victor Emmanuel Ranges were again viewed. These ranges, which appeared to lie wholly within the German territory, are apparently excessively rugged and precipitous, part of them, at least, being inaccessible. Between these and the position of the explorers lay a range of mountains of from 5,000ft. to 6,000ft. high. Part of this, which appeared to lie within the German possession, was named Mount Blucher, and the British section Mount Donaldson. This part of the country appeared to be inhabited by a large population, less nomadic than their southern neighbours. Their large and well-cultivated gardens denoted the habits of an agricultural class of people. In view of the scattered position of the expedition, and the fact that a much longer time would be required to explore the ranges than the party could afford to devote to that purpose, it was decided to turn back. Commencing the return journey on the morning of the 24th January, 1890, the scattered fragments of the expedition were collected safely, and the mouth of the river reached after an absence of five weeks and four days, the distance travelled during that time being about 1,200 miles. Concerning the results of this expedition, the first to accomplish the remarkable feat of navigating over 600 miles of river in the interior of New Guinea, it may briefly be stated that for administration purposes the information obtained is important. Commercially, however, the results are of less value, especially above Everill Junction. The existence of gold has been clearly established beyond doubt, but we are not justified in believing that it would be obtainable in payable quantities.

Although thunderstorms were usual after two or three o'clock in the afternoon there appeared to be no regular rainy season. The temperature ranged from 85deg. to 90deg. Fahr. during the daytime; at night the thermometer fell from 72deg. to 76deg. Fahr., a change that Sir William MacGregor could only account for by assuming that the colder currents were wafted from the snowy mountains of Dutch New Guinea. The highland regions enjoy comparative immunity from mosquitoes and sandflies. Two cases of sickness per day was the average condition of the health of a party of 19. In all only one of these gave the leader any anxiety. No evidence was obtained of the existence of an interior tribe distinct from the coastal natives. The dialects of the upper and lower tribes differ entirely. They are agriculturalists and live in settled communities on the lower part of the river; in the middle region they are nomadic, owing to the low, swampy condition of the country and the occurrence of flood; the dwellers of the upland zone are apparently fixed cultivators of the soil. Their weapons consist of the bow and arrow. The women clothe themselves with the usual petticoats, and the bodies of the men are tattooed. The more favourable season to explore the Fly basin would be during the months of June and July. It would then be possible to obtain infor-

mation upon the climate, during the south-east monsoons. The birds would then appear in their most gorgeous plumage, and the collections for scientific purposes would in consequence be more valuable. It was a source of very great satisfaction to the leader that during the progress of the expedition the relations maintained with the natives were of the most friendly character, excepting in one instance, in which no reason can be assigned for the hostility offered at Lario Bank.

Concurrently with the Fly River exploration the Administrator extended his examination to the western country, towards the Anglo-Dutch boundary. Part of this region, within the boundary of the Kawa Kussa delta, had formerly been visited by various exploration parties, so that no remarkable new geographic features were discovered by this expedition. Careful examination, however, threw some light upon formerly obscure questions concerning the geography of the numerous water channels abounding in this locality. Advantage was taken of this occasion to examine the hill of Mabuadauan, at the mouth of the Kawa Kussa River. Upon this prominence, of some 200ft. in height, it was decided to establish a station for the use of the Government Resident Magistrate. The inhabitants of this region live a wretched life of uncertainty and unrest, being constantly terrorised by the Tugeri tribe, who, approaching from the westward, annually fall upon these people and massacre both men, women, and children. It was noticed that the Kiwai Island dialect was understood as far west as the Island of Saibai. No natives, nor signs of human habitation, were met with from the Makussa delta to within 70 or 80 miles of the Anglo-Dutch boundary, the whole of this vast unoccupied region being chiefly remarkable for its low uninteresting character and extensive mangrove foreshore. While examining the coast line Sir Wm. MacGregor discovered an important river, dismorguing into Heath Bay, in latitude 9deg. 15min. S., longitude 141deg. 30min. E. To this stream the name of Morehead River was given, in honour of the Hon. B. D. Morehead, late Chief Secretary of Queensland. It is a fine watercourse of some 200 yards broad and probably five fathoms in depth at its mouth. The country in the neighbourhood of its lower reaches is swampy and unattractive, being clothed with dense forest, mangroves, and other varieties of vegetation, upon which the eye is constrained to rest in the absence of a brighter landscape. Above this region the river assumes the form of continuous lagoons and swamps, so that no defined banks mark the limit of the stream. These swamps are the haunts of wild pigmy geese, catfish, and crocodiles. Some natives were seen and heard, but all efforts to induce them to hold intercourse with the explorers failed. Their outriggerless canoes, dug out of hard dark wood with stone adzes, measured about 20 feet long. In their gardens, which were neatly cultivated, grew two varieties of sugar cane and patches of taro. On the higher reaches of the river the natives were somewhat less shy, and after very tedious parleying they were induced to hold brief intercourse with the visitors. Their language being entirely different from that spoken by other known tribes was not understood by the explorers.

When in the neighbourhood of the Anglo-Dutch boundary the expedition was much gratified to meet a camp of representatives of the notorious Tugeri tribe. Physically they are equal to any other known tribe of the possession, being of singularly robust appearance with light brown skin and hazel eyes. Their heads, which are prominent and well formed, were adorned by frizzly hair, plaited into long pendants with the lower ends formed into small balls hanging down upon the neck of the wearer. They pierce the ears and ornament them profusely with large rings of the wire feathers of the cassowary. The septum of the nose is also pierced and likewise ornamented. They encircle the neck with pigtails, parts of the human body, dried and tanned, and strings of wallaby teeth. While lavishly ornamenting themselves, in other respects they exhibited no indications of tattooing, nor other

special skin marks. Their mode of salutation is to touch the navel, an operation which they perform with special grace. Their weapons consist of the bow and arrow, in the use of which they are remarkably dexterous. At first it was intended to adopt such measures as would probably prevent these pirates from undertaking their usual annual journey eastward for man hunting purposes, but it was unfortunately discovered, to the great disappointment of the leader, that the Tugeri camp was on Dutch territory. In this district spring tides rise and fall 12ft., one full tide occurring once in every 24 hours. The very low tides occur in the evening, when several miles of foreshore are left dry by the receding waters. The current of the rising tide sets strongly eastward, and that of the fall towards the west. At 9 o'clock the morning calms are replaced by a northerly breeze, which continues till noon, when a strong southerly wind sets in; after continuing in this direction for several hours it gradually works back again to the northward. Electrical disturbances, associated with heavy precipitations, originating in violent squalls, were of daily occurrence. The recorded maximum and minimum thermometric measurements were 75deg. and 92deg. Fahr. in the shade.

CLIMATE.

Concerning the climate of British New Guinea we are not in possession of sufficient data to enable us to write with any degree of authority, nor yet are we able to contribute anything of special use to climatology. Generally speaking it may be said that the possession is healthy, no dangerous epidemics being known, and, excepting occasional attacks of malarial fever, Europeans suffer no greater inconveniences than residents of other tropical climes. In the Alpine zone of the Owen Stanley Range the climate is apparently dry and bracing, and in the basin of the Upper Fly River the temperature during the night-time is invigorating and refreshing, mosquitoes and sandflies being less troublesome than in the coastal districts. Speaking of the climate Sir Wm. MacGregor says:—"For my part I was always glad of a blanket in a morning; such a covering I could not tolerate at Port Moresby or in the east part of the possession at this time of the year." This makes the Upper Fly River district rather a pleasant abode at this time of the season (January). In the neighbourhood of the east end of the territory several of the numerous islands enjoy salubrity of climate and freedom from the drawbacks so frequently experienced in low swampy localities. Essentially a tropical climate British New Guinea possesses a wet and dry season, the former extending from November to the end of March, during which time heavy thunder storms, accompanied by drenching rain, prevail. While the dry season lasts the south-east trade winds contribute greatly to the comforts of life and to the salubrity of the climate.

The affairs of the territory are administered from three principal centres of organisation, Port Moresby being the geographical centre, Samaria the Eastern Division, and Mabudauan the Western District. At each of these places a Resident Magistrate is stationed with jurisdiction over a given area.

RELIGIOUS ORGANISATIONS.

The organisations devoted to Christianity are—(1), the London Missionary Society, dominating the division extending from East Cape west to the Anglo-Dutch boundary, excepting the St. Joseph's district; (2) the Wesleyans, who occupy the Archipelagos of islands in the south-east end; (3) the Anglicans, whose field of operations extends over the whole north-east coast line; and (4) the Roman Catholics, located on Yule Island, in the St. Joseph's District. Some of these have quite recently established

themselves, but there can be no doubt that the influence of their presence on the native mind must be very considerable.

NATIVES.

A remarkable feature of the native inhabitants is the numerous tribal divisions and the almost correspondingly different languages or dialects spoken by them. Even in localities separated by only a few miles, the dialects spoken differ the one from the other in some cases considerably. The Motu, which is the language spoken and taught by the missionaries at Port Moresby, is understood over a considerable area both east and west of that place, but outside that neighbourhood changes and variations occur, so that at the head of the Great Papuan Gulf, and in the Fly basin, the Motu language is a foreign tongue. The same also applies to the eastern end, and to the islands adjacent thereto, where the philological variations are numerous and conflicting. While in the one case the people met with in the highland zones of the Owen Stanley Range speak a dialect akin to that of the Papuan, those encountered on the Upper Fly River express themselves in a tongue, every word of which apparently differs from that spoken by the tribes of the lower regions, and from that spoken by any known coastal community, notwithstanding that the people themselves exhibit no evidence of possessing distinctive characteristics of race, the only marked contrast being in lightness of colour. In the western division the same diversification of speech is met with, where neighbouring tribes are unable to hold intercourse one with the other, even if friendly, by reason of incompatibility of language. No doubt this may in some measure be accounted for by local environment, constant civil intertribal war being the means of isolating communities, so that no friendly intercourse is held, by reason of which, together with other attendant causes, an incongruity of language may have unknowingly been established.

Of the ethnography of these natives we do not as yet possess sufficient data with which to elucidate that interesting branch of knowledge; its elaboration must therefore be left to future generalisation.

FAUNA.

The fauna is of a fairly representative character; there are no big game, such as that met with in Africa and India, but its avifauna rivals that of any other part of the world. Of animals, those chiefly to be found are the wild and domestic pigs and dogs, the tree kangaroo (*Dendrolagus dorianus*) wallabies, cuscus, cats, rats, mice (Bita), etc. The pigs are animals of great value to the native inhabitants; they are fondled and petted like children, the young being sometimes suckled at the breasts of the women, an abominable practice in itself, and greatly intensified when associated with infants. The market value of the pig is occasionally equal to that of a human being. Some of the dogs are almost, if not wholly, identical with the Australian dingo; those met with on the Upper Fly River being of a bright orange colour, and somewhat graceful in appearance.

Reptiles are represented by a considerable number of different species, the largest of which are those dreaded amphibious monsters of the Saurian family, the alligators, which are plentifully scattered throughout the territory in the numerous rivers, creeks, and swamps, being a constant menace to human life. The snake family is well represented, those met with, however, being chiefly common to Australia, excepting the death adder (*Acanthophis*), and the whip snake (*Diemansia*); the greater number of reptiles are innocuous; lizards and frogs also abound in all parts of the possession. Insects are in swarms; even from the harmless butterfly to the dreaded scorpion. Of the feathered family New Guinea can probably produce a more brilliant variety than

any other island of the globe. There is the noble cassowary, the large and pygmy geese, ducks, fowls, pigeons, cockatoos (both black and white), parrots, kingfishers, hornbills, riflebirds, several varieties of bowerbirds, the cat bird, and probably over 25 different species of the paradise birds.

GEOLOGY.

As yet our insight of the geology is both elementary and fragmentary. Based upon no specially geological examination, our acquired knowledge is more hypothetic than practical, being derived chiefly from examination of collected specimens, which probably do not fully represent the primary condition of the localities from which they were obtained. Notwithstanding this it will be freely admitted that many useful and practical data are available upon which a general sketch may be based. The first collection of specimens from the Fly River revealed the auriferous character of that part of the territory. Although the analysis was based chiefly upon some stone tomahawks of altered sandstone and greenstone or diorite, the results obtained were indicative of the existence of gold; while inferentially the conclusions we are enabled to arrive at of the probable auriferous character of the high ranges of the interior are derived from an examination of the fragmentary specimens of slate, quartz, sandstone, greenstone, and jasperoid rocks, obtained from the coast, east of Redscar Bay, also from the material adduced by the expedition to the summit of the Owen Stanley Range, upon which occasion indications of gold were actually obtained in the bed of the Vanapa River. Basaltic lavas occur frequently and palæozoic rocks are met with in abundance. The fossiliferous rocks noticed were those belonging to the tertiary period. Of the specimens obtained, the first were discovered at Yule Island. Others have since been found in several localities in the possession, notably the Upper Strickland River, where marine fossils, chiefly mollusca, were discovered; the occurrence of ammonites, on the middle region of that water-course, was also met with. It is clear, however, that in speaking of the palæontology much care and caution is necessary, and that even the best results obtainable are only those of a fragmentary character, to which too great an importance cannot be attached. Of the goldfields we are in a position to summarise with some considerable degree of confidence, both with regard to the localities operated upon, and the probable value of the issues of these operations. Although gold-bearing deposits have been obtained in several districts of the possession the chief, and practically the only centre of activity, is the island of Sud-Est, and in a much lesser degree some of the neighbouring islands, where gold in payable quantities is procured. It is a somewhat remarkable fact that the general geologic features of British Papua are in a very considerable degree identified in character with those of Australia, several specimens being coincident with those of the Silurian series from goldfields in New South Wales, while some of the fossiliferous rocks were obtained from beds of clay similar to those at Geelong and Cape Otway in Victoria. From these foregoing remarks it may not be unreasonable, nor unjustifiable, to assume that mineral areas of great value may yet await discovery by the penetrating eyes of British pluck and enterprise.

[Mr. Thomson uses the word "Papuan" in meaning New Guinea and the surrounding islands; the word "Papua" he uses for New Guinea. It is a matter of great regret that native names of mountains, rivers, &c., are being put aside for the names of Europeans. The native names have a meaning, and in future times would be of great interest and value.]

*PROCEEDINGS OF THE SOCIETY.*JANUARY 1st TO MARCH 31st, 1892.

The 190th Meeting of the Society was a party given by the Victorians to the young children of the members at the Cotton Waste Exchange, Saturday, January 2nd, 1892, at five o'clock p.m. The Rev. S. A. STEINTHAL presided during a part of the meeting. About 180 children were present.

Lantern views of localities in various parts of the world, a beautiful collection lent by Mr. Mark W. Thompstone, and some other slides, were shown to the great delight of the young people. Games and little romps diversified the evening.

The Victorians were assisted by other members of the Society and several ladies. The meeting closed at about ten o'clock.

The 191st Meeting of the Society, held in the Library, Monday, January 11th, 1892, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

The minutes of meetings held December 9th (188), 19th (189), January 2nd (190) were read and approved.

A number of presentations and the election of the following members were announced:—

ORDINARY.—*Messrs.* James Boyd, J. P. Cowper, Benjamin Crosland, George Ramsbottom, T. F. Wainwright.

A paper contributed by Professor Arminius Vambéry, of Budapesth, on "The Turco Tatars" (see page 1) was read, and the abstract of a paper by Mr. Budgett Meakin on "Morocco." A long discussion ensued on the papers, and Mr. J. P. Thomson's paper on "Practical Suggestions to Travellers" was further discussed. Thanks to the writers and readers of the papers closed the meeting.

The 192nd meeting of the Society, held in the Memorial Hall, Friday, January 22nd, 1892, at 7-30 p.m., Mr. JOB IRLAM in the chair.

Mr. J. E. BUDGETT MEAKIN addressed the members on "Morocco: As it is and might be." The address was illustrated with a large and interesting collection of curiosities, arms, and native cloths and by a number of slides from Mr. Meakin's photographs.

MOROCCO: AS IT IS AND MIGHT BE.

[By Mr. J. E. BUDGETT MEAKIN.]

Mr. MEAKIN, in the course of his address, said that no doubt the high pitch of excellence to which the Moors had attained when they ruled in Spain would be remembered, and it was also to be understood that these Moors were essentially the same people to-day. They possessed their old courage and high bearing, and that too was a point necessary to be borne in mind. But the Government had continually

grown more and more effete, until it had become rotten, and thus a country which teemed with mineral and agricultural wealth had been so neglected that its name was now a by-word. The Moors were not only oppressed themselves, but so also were the Jews. It would, however, be a mistake to suppose that the Sultan of Morocco had unlimited power and was alone responsible for these oppressions. There were around the Sultan a number of rulers, who in a measure corresponded to our own ancient barons under the feudal dispensation, and thus those who reflected on the history of our own country would have no difficulty in understanding why Morocco was in a state of constant oppression. The state of public morality had also sunk very low, judged by a proper standard, but it would nevertheless be found by those who treated the Moors well that a corresponding treatment on their part would be received in return. Morocco was, in fact, some two hundred years behind England in civilisation, and if that were acknowledged we should be able to form a correct opinion of the state of the people. Notwithstanding the fact that we had some 300 books of travel on Morocco, it was surprising how much real ignorance existed, as the majority of travellers went over the same well-worn ground. The people were really very hospitable, and it was the ill-treatment that they received, and which brought about a corresponding violence of character, that had given rise to a different opinion. As to what had been talked of lately with regard to an insurrection around Tangier, that matter had been greatly exaggerated. The oppressed Moors had no doubt taken some means to prevent such gross oppression as was carried on, and which under the system of government in Morocco was kept from the ears of the Sultan, but there had been nothing of the serious nature which had been written of in some papers. The fact was that these rumours of insurrections were raised periodically in the interests of France and Spain, in order that those countries might have some pretext for interfering in the affairs of Morocco for a purpose which, of course, it was not necessary to explain. The lecturer then explained the geographical position of Morocco, and described the characteristics of its towns. Dealing with the trade of Morocco, he said the greater portion was in the hands of Great Britain, or passed through its hands. It was steadily increasing, but speedy growth was prevented by the obstructive policy of the Moorish Government. This arose not from any inherent antipathy to foreigners so much as from fear of their political schemes. The Sultan exercised the skill acquired in retaining his authority at home by pitting one tribe against another, in pitting one European power against another, and so kept all at bay. This policy was forced upon him by their scheming to involve him in compromising situations. Consequently every interest of the country suffered, and the foreign trade especially. Notwithstanding this, there were great opportunities and openings for men with capital and an adequate acquaintance with the ground. These did not consist in cutting finer than ever the competition in the prices of Manchester goods—which at present head the import list—or in tea, sugar, and candles, which ranked next, but in the development of new lines, and by the establishment of manufactories in the country itself. By this means the exceedingly cheap native products and labour could be utilised in furnishing both the home and foreign demand. As to the import trade, there was no reason why new demands should not be skilfully created, just as that for tea was a century and a half ago—till then totally unknown in the country. The capabilities of the country, in an agricultural way, might be understood from the fact that maize was exported in considerable quantities after paying no less than 105 per cent duty. The harbours needed dredging and otherwise improving, but that could not be done because under the present condition of things what one European country advised another deprecated, and so things drifted, or remained *in statu quo*. As to the population, in Tangier the most influential members of it were the Jews,

and although in some parts they were subjected to great oppression that was in a large measure due to the usurious habits of some among that people. They greatly needed education, and if they could only see even a few schools established such as we had the advantage of having in this country and in America, great things might be effected, for the Jews were not only, as it was, the most enlightened part of the population, but also the most energetic. Indeed, he looked upon them as the hope of Barbary. The state of morals of which he had spoken as existing among the Moors existed to nothing like the same extent, or scarcely at all, among the Jews.

The SECRETARY asked Mr. Meakin a question in reference to the boundary line, on various maps, between Algiers and Morocco, pointing out the great difficulty of ascertaining the true line, more particularly in reference to recent events in that quarter.

Several other questions were asked, and Mr. Meakin replied thereto.

Mr. JACOBY (who is one of the greatest authorities on North African commercial questions) then said: I think this Society is under very great obligations to Mr. Sowerbutts for putting the question to Mr. Meakin as to his reasons for comprising in his map the cluster of 300 or 400 oases of Gurara, Tuât, and Tidikelt, confederated in a union of republics known as the Confederacy of Tuât, within the boundaries of the empire of Morocco. Our Society had the intention of publishing along with my address on "British Trade with Algeria, Tunis, and the Sahara" (*Journal of the Manchester Geographical Society*, 1890, Vol. VI.), a map of Northern Africa, showing the Trans-Saharan trade routes, but our desire to hold an even balance between two friendly powers who both laid claim to this fertile belt of oases caused us to hesitate in drawing up the map before our investigations had led us to positive conclusions on the point at issue. During my recent sojourn at Tangier, however, I was much surprised by the presentation to me of two maps issued by the French War Office, since the last war between France and Morocco, in both of which the Confederacy of Tuât was comprised within the Moroccan frontiers, as likewise in the map attached to the account of "Travels to Morocco, the Atlas, the Oases of Tafilet, Tuât, and Tidikelt," by Gerhard Rohlfs, the only European who has traversed that country to the present day. Now it is asked, What have we Manchester people to do with this Tuât question? Well, I think we have a great deal to do with it. In the first place, these oases are inhabited by about half a million of people as well clad as the Moors of Algeria, who consume our productions. The district, moreover, contains about ten million date palms, whose annual yield contributes a considerable trade movement to the Mediterranean ports. Lord Salisbury's ideas of a barren sand waste are all moonshine. The district also includes Aïn-Salah or Insalah, the great emporium and centre of Saharan commerce, which, lying at about an equal distance of 800 miles from Timbuctoo, Mogador, Tangier, A'gier, and Tripoli, is the point towards which converge the caravans which pass from the Moroccan ports or from Tripoli to Timbuctoo and the Sudan. Lancashire and Glasgow textiles, also candles, tea, and many other goods exported from this country, together with the salt which the caravans barter on the way at the salt lakes, form the chief medium of exchange against the Saharan and Sudan products. Lord Salisbury, without consulting the commercial bodies of this country, surrendered, under the Anglo-French agreement, these trade routes to the tender mercies of the French, and gave them permission to sap and intercept by means of contemplated customs barriers the very arteries of Moroccan and Trans-Saharan commerce. What we may expect from France is shown by their new tariff scheme for Algeria, in which the present exorbitant duties of about 25 per cent are, on an average, not only doubled, but also rendered prohibitive by an intricate and barbarous system of tariff-

cation. Sir Lambert Playfair, our Consul-General at Algiers, who is known for his philo-French proclivities, thus comments on the new tariff in his latest report, No. 853 :—"The feature in the proposed new tariff, which seems to me most likely to hinder the importation of English cotton goods is the enormous augmentation in the number of categories that will be established by it. It is impossible to secure absolute accuracy, and many goods passing the severe scrutiny of the French customs-house in Algeria will undoubtedly be found different from the manifested qualities, and so will be liable to a fine, one half of which is payable to the discoverer of the error. In Algiers purchasers of cotton goods will have nothing to say to their own customs-house, they will only buy duty paid ; they did so even during the continuance of the Cobden Treaty, thus throwing all the risk on the British merchant. He must add to the cost price and his profit a percentage on the capital necessary for paying the import duties, and an insurance for the fines which will certainly be inflicted, *all which are paid by the consumer, generally the poor Arabs, who are already taxed almost more than they can bear.* The entire trade of Morocco, imports and exports together, is now estimated at two and a half million pounds sterling per year, of which about two-thirds is in British hands. Our statistics, as I have conclusively proved in my before-mentioned address, are utterly fallacious. There cannot be the slightest doubt that our trade with that country is greatly in excess of that with East and West Africa put together. I trust that no more commercial arrangements will be negotiated by the Foreign Office without first consulting the representative associations of the merchants and manufacturers of this country, and that no existing rights and privileges will be sacrificed to our rivals, who already have so much advantage over British productions, by virtue of their ultra-protectionist fiscal policy."

The CHAIRMAN then said : Mr. Jacoby has mentioned the fact that we do in this country about three-quarter million pounds sterling of trade with Morocco in British textiles. Our lecturer has told us that the trade is much larger than the Custom House returns show, but, taking our textile trade with that country at three-quarter million pounds sterling, what does it mean ? What does it represent ? Few of us can tell this. Scarcely anyone present can realise what is meant by a three-quarter million pounds of textiles ; but while Mr. Jacoby has been speaking I have been making a rough calculation of what this bulk of trade means to Lancashire and Glasgow, although a very small portion of the whole of our export trade. It means 7,500 looms kept working all the year round, and 225,000 spindles to provide yarn for these looms ; it represents besides this an enormous staff employed in dyeing, finishing, sizing, making-up, and packing these goods, together with managers, foremen, clerks, merchants, and shippers ; so that we may easily see that this question of our foreign markets is not only important to our merchants, but also to manufacturers, dyers, finishers, etc., but most of all to the working classes and small tradesmen of this country. When we take also into account that our merchants have sunk thousands of pounds to build up an export trade to the different parts of the world, I say it is a burning shame that the money and energy they have used should be jeopardised, and in some instances lost altogether, by the mere stroke of the pen of our foreign office officials, who know little and care less about the traders of the country. Very often when a difficulty arises with a foreign country the officials will make treaties, sign away territory, without the slightest consideration for the merchants and traders, or even a proper knowledge of the geography of the territory they are dealing with. The least that the Government of the day could be expected to do would be to inquire if we had any commercial interests in the different places when making treaties with foreign countries, and consult the traders who were most interested in those places. This is certainly what other governments do when they are making new treaties.

Our English merchants and traders have had commercial intercourse with nearly every part of the coast of Africa, and in building up a trade which has increased in bulk year by year enormous sums of money have been spent, and hundreds of valuable English lives have been lost before there has been any profitable results (for it is well known now that Africa is comparatively healthy within fifty or sixty miles of the coast, except where the swamps are, but near the coast it is most unhealthy, and few Europeans can live there), but now we find European powers struggling for what is called the Hinterland. We have an instance in this in the coast-line near to the Island of Zanzibar, which has been secured by the Germans, together with most of the other land which was crossed by Dr. Livingstone in his last journey, all of which could have been secured by this country if our Government officials had only been alive to the commercial interest of their own countrymen. This is only one of many instances which might be cited to prove the culpable neglect of our own Government to look after the real interests of our own people, in so far as that interest is bound up with our foreign trade. This is not a political question of Conservative or Liberal, for both have been far too negligent in the past; but it is a question for the people of this country to seriously consider whether we are to go to sleep while our export trade is taken from us, or whether we are to be alive, as other nations are, to our own interest, and not only be determined to retain what foreign trade we have, but also to increase it. From open and fair competition we have nothing to fear, but from other countries who have taken possession of the Hinterland in Africa, as many of them have done, and then put on protective duties against us of from 15 to 55 per cent. and more, we have much to fear. Therefore we ought not leave our merchants to fight out this battle alone, but they ought to have the assistance of every right-minded and right-thinking Englishman. Each person ought to look upon this as an individual matter. By the press, by speech, by vote, we ought to so bring pressure to bear on the Government of the day that they will not dare to neglect this great duty any longer.

The CHAIRMAN moved a very hearty vote of thanks to Mr. Meakin, which was carried unanimously.

The Members then spent some time in examining the very interesting collection of native cloths, pottery, metal work, and arms, and thanks to the Chairman closed, at a late hour, a very interesting and instructive meeting.

The *Manchester Guardian* had the following remarks upon the address of Mr. Meakin: "The lecture upon Morocco which was delivered last night by Mr. Meakin to the Manchester Geographical Society gives a valuable corroboration to the account of that country recently published in the *Times*. Mr. Meakin explained that the late troubles were not half so serious as was at first supposed, and that they were magnified to serve the political ends of some of the powers. Whatever disturbance there was has ended in the recall of a Governor and the appointment of a new one. Mr. Meakin also gave an interesting sketch of the condition of the country. The land is rich and productive. It is fertile of cereals and has considerable mineral wealth. The people are the same Moors who once figured so largely in Western Europe. Mr. Meakin seems to admit no degeneracy in them except what is due to bad government. This is rather a rosy view of the condition of a people that has gone down in the world. A government has no doubt a very close connection with the character of the people who support or endure it. But it is hardly sound to suppose this relation to be one-sided. The qualities of an administration may be the cause, but they are also the consequence of the habits and disposition of the people. Without too strictly

construing Mr. Meakin's language upon this point, we may note with satisfaction the high estimate he has formed of the personal qualities of the Moors of to-day, and of the Jews of Tangier, who, in spite of persecution or because of it, are the most industrious and thriftiest subjects of the Sultan of Morocco. Mr. Meakin thinks there is room for the further expansion of British trade with Morocco. He points out that the chief obstacle to the economical progress of the country lies in the political jealousies of the powers. There is, we fear, no prospect of a change in this respect. But a great deal can be done by intelligent commercial enterprise in spite of political difficulties. The one thing needed, according to Mr. Meakin, by the would-be trader to Morocco is capital, or rather capital is the first thing, and a careful study of the country and its people the second. The Geographical Society has done a service to the community by arranging so useful a lecture."

The 193rd Meeting of the Society, held at the Schiller Anstalt (a joint meeting of the Schiller Anstalt and the Society), Tuesday, January 26th, 1892, at 8 p.m. Herr A. LANGE in the chair.

Mr. THOMAS WEIR addressed the members on "Astronomy in Relation to Geography," illustrating the address with a number of diagrams, and repeating Foucault's pendulum experiment very satisfactorily. The model of a quadrant by Tycho Brahe, photographs of the moon from the Lick Observatory and of Galileo's telescopes were shown.

Hearty thanks were passed to Mr. Weir for his address, and to the Chairman, which closed the meeting.

The 194th Meeting of the Society, held in the Library, Friday, January 29th, 1892, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

The Minutes of Meetings held January 11th (191), 22nd (192), 26th (193), were read and approved. Presentations to the Library and the election of the following members were announced:—

ORDINARY: Messrs. Henry Champ, S. Bevan Davies, J. E. King, M.A., J. J. Lambert, John Mather, and Frank Short.

AFFILIATED SOCIETY: Oldham Corporation Free Libraries Committee.

Letters were read from the Paris Geographical Society, announcing the death of the President (M. De Quatrefages de Bréau), from the Marquis de Nadaillac, Dr. Konrad Ganzenmüller, and the following reply to the resolution of sympathy passed by the Society on the death of its President, the Duke of Devonshire:—

"Hardwick Hall, Chesterfield, Jan. 10, 1892.

"Lady Louisa Egerton very warmly thanks the Council of the Manchester Geographical Society for the expression of sympathy which was received last month, but which the pressure of correspondence has prevented her from acknowledging earlier."

The SECRETARY then read a paper by Mr. George Dobson, of Cardiff, on the "Volta River" (see page 19), exhibiting a tracing of Mr. Dobson's survey of the Upper Volta. A paper by Dr. Konrad Ganzenmüller on "The Teaching of Geography Made More Interesting" was also read. Several African maps by French and English authorities and map-makers were exhibited.

A considerable discussion ensued on the subjects dealt with, and thanks to the writers of the papers and to the Chairman were passed unanimously.

The 195th Meeting of the Society, held in the Chemical Theatre of Owens College, in conjunction with the College, on Thursday, February 4th, 1892, at 8 p.m. Mr. Alderman JOSEPH THOMPSON in the chair.

Dr. FRIDTJOF NANSEN addressed a large meeting on "The North Pole." The address was illustrated with the large map of the Arctic regions presented to the Society by Mr. J. H. Gurney, F.R.G.S., of Norwich, lit up with the lime-light by Mr. Heywood.

THE NORTH POLE.

(By Dr. FRIDTJOF NANSEN, of Christiania).

Dr. NANSEN said that the parts of the globe which had hitherto most obstinately resisted all travellers were the regions around the Poles. In the case of these regions we had no experience that would guide us to any certain conclusion, and the conditions were such that the most ingenious speculations were apt to prove fallacious. As science advanced and the world became more and more known problems had arisen which could only be solved in these regions. It was hardly possible to study physical geography and other matters without being struck by important questions which could only be answered in the arctic and antarctic regions, and in regard to which we could now only offer highly uncertain hypotheses. Since, therefore, it was only in these regions that such branches of science could be developed, the question of what was the use of Polar expeditions was almost equivalent to the question of what was the use of the advancement of knowledge. The reason why the North Pole had hitherto attracted more attention than the South Pole was probably because it was situated in our own hemisphere. He alluded to the various attempts which had already been made to reach the North Pole. Why, he asked, did all these fail? The reason was simple enough. The expeditions were everywhere, at a greater or less distance from the Pole, stopped by the drift of ice floes, carried down in most cases by currents from the north. It had been found impossible to penetrate these floes, and to walk over them was not much easier. No land had yet been discovered from which an advance towards the North Pole would be likely to succeed. If such land could be found he did not think it would be more difficult to reach the Pole than it had been to cross Greenland. Many people thought it could be reached through the air in a balloon or a balloon ship. He did not deny the possibility. On the contrary, he regarded it as a very likely scheme, if we had sufficient knowledge of the wind currents in the Polar basin and there was a happy combination of circumstances. Another idea was to go in a submarine boat, but that, he thought, would be rather risky. Was there no other way? Most Polar expeditions had been stopped by currents from the unknown north, carrying immense masses of floe ice. They were entitled to draw the conclusion that if there were opposing Polar currents there must somewhere exist one or several favourable currents. The water carried southwards must somewhere return to the Polar basin. As some expeditions had been carried southward, others might be floated northward if they could only strike the current on the right side. The problem was to find the right place. The most important Polar current was that which runs southward along the east coast of Greenland. It was 250 miles broad, and of considerable depth. Its speed was about two miles in twenty-four hours, and in that time it carried southwards from 80 to 150 cubic miles of water. Whence was that water taken? He explained in detail the sources from which the Polar basin received contributions, the chief of which go in by Nova Zembla and Behring Strait. The Siberian rivers also sent a large mass of water into the Polar Sea. He expected that the main body of the ingoing current would be met with somewhere in the neighbourhood of the new Siberian islands, off the mouth of the Lena river. From this region the current

would most naturally run in a northerly direction across the Pole. It was upon this theory that he would base his scheme. He submitted a number of proofs of the existence of a current across the Polar basin. The *Jeannette* sank near the New Siberian Islands, and relics of that vessel were found three years afterwards on the west coast of Greenland. A throwing stick, or harpoon, had been found on the same coast, which must have floated across the Polar Sea from Alaska. The driftwood which came to the Greenland coast was partly of American and partly of Siberian origin. Other evidences of the existence of a current across the Polar basin had lately been found in the dust on the Greenland ice floes, some of which was traced to Behring Strait. He explained the manner in which he intended to utilise this current. He was building a wooden ship (see p. 339, vol. 7), of oak and greenheart, about 250 tons burden. She would be the strongest vessel which had ever been taken to the Arctic regions. Her wedge shape would enable her to rise on the ice when subjected to pressure, and she would have engine power to steam at six or seven knots an hour. She would have a crew of ten or twelve, including a number of scientific gentlemen, and would be provisioned for five or six years. He would enter the Polar regions through Behring Strait and sail along the North Siberian coast towards the New Siberian Islands. There he would wait for the right moment and push as far north as possible in the open water. Then they would push on into the ice, and when they could get no further they would drift with the floes in the direction, as he hoped, of the Pole. While drifting along they would have plenty of opportunity to make scientific observations, and for this purpose a captive balloon would be brought into use. He expected that in the course of a year or two they would be carried across the Polar sea into the region of Spitzbergen. They might have to leave the ship, and small boats would be provided for that emergency. That there would be no great risk in taking to the drifting ice floe he had to some extent learned from his Greenland expedition. When they emerged into open water on this side of the Pole he did not anticipate there would be any difficulty, even if they had left the ship, in returning home. At the same time it would not be a holiday trip. The region where the day lasted six months and the nights were no shorter was not the place in which to seek pleasure.

The Rev. S. A. STEINTHAL, as representing the Manchester Geographical Society, proposed a vote of thanks to Dr. Nansen for his address.

Dr. WARD, in seconding the motion, expressed the hope that the connection between the College and the Geographical Society would be drawn closer and closer. He intimated that through the kindness of the Royal Geographical Society and the Manchester Geographical Society arrangements were being made to endow at Owens College a lectureship in branches of geographical knowledge not hitherto taught there. Speaking of Dr. Nansen's work, he said there were not many who had the privilege of uniting the quality of man of letters, man of science, and man of action. Towards scientific discovery of this kind there went something of knowledge, something of enterprise, but also something of faith. He assured Dr. Nansen that it was not a spirit of idle curiosity that had led the least of them to attend the meeting, but a spirit of sympathy and the hope that, under God's blessing, success would attend him in the great scientific inquiry and the great test of manhood he was going forth to encounter.

Captain JEPHSON, one of the officers of Stanley's expedition, briefly addressed the meeting. As an explorer of a hot country he wished all success to his friend of the cold country.

The vote of thanks having been passed and responded to, Dr. Nansen held quite a levée at the close of the meeting.

The 196th Meeting of the Society, held in the Chamber of Commerce Board Room, Monday, February 8th, 1892, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

Professor W. BOYD DAWKINS, M.A., F.R.S., addressed the members on "Geology in Relation to Geography," illustrating his address with diagrams and black-board sketches.

Mr. STIRRUP moved, Dr. CASARTELLI seconded, and Mr. HURST supported a cordial vote of thanks to Professor Boyd Dawkins for his admirable address, to which the Professor responded.

A small number of colliery lads from the Pendleton Lads' Club were present and thoroughly enjoyed the address.

The 197th Meeting of the Society, held in the Library, Friday, February 26th, 1892, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

The Minutes of Meetings, held February 4th (195) and 8th (196), were read and approved. The presentations to the Society and the election of the following members were announced:—

LIFE.—Sir Humphrey F. de Trafford, Bart. (in lieu of Ordinary).

ORDINARY.—Messrs. R. Hope Brown, H. T. Crook, C.E., B. Kershaw (in lieu of Associate); Herbert Richardson.

ASSOCIATE.—Messrs. J. W. Cranfield, Harry Hall, John Hall, J. J. Raftery, F. J. Robertshaw.

Letters of condolence with this Society on the death of its President, His Grace the Duke of Devonshire, had been received from the following societies and scientists:—

Société Neuchâteloise de Géographie; Société Antiesclavagiste de France; Société de Géographie de Marseille; Société de Géographie de Paris; Professor Guido Cora, Editor of "Cosmos," Turin; Società Geografica Italiana, Rome; Württ. Verein für Handelsgeographie, Stuttgart; Union Géographique du Nord de la France, Douai; Sociedade de Geographia de Lisboa; Croydon Microscopical and Natural History Club; Brigadier-General A. W. Greeley, Chief Signal Officer, U.S. Army; Société de Géographie de Tours; Königsberger Geographische Gesellschaft; Geographische Gesellschaft in Hamburg; Société Bourguignonne de Géographie, Dijon; Société Académique de Brest; M. le Comte de Bizemont, Paris; Dr. Phil. M. Lindeman, Bremen; Société de Géographie, Tours; M. le Marquis de Nadaillac, Paris; M. Paul Vibert, Paris; Société de Topographie de France, Paris; The Canadian Institute, Toronto; Société Hongroise de Géographie, Budapest; Société Khédiviale de Géographie, Cairo; Geographische Gesellschaft in Lübeck; Société Royale Belge de Géographie, Brussels; Sociedad Geográfica de Madrid; Geographical Society of the Pacific, San Francisco; Sociedad Geográfica de Lima, Peru; Société Académique Indo-Chinoise de France, Paris; Royal Geographical Society of Australasia, Adelaide; Mr. J. P. Thomson, F.R.S.G.S., Brisbane; Royal Geographical Society of Australasia, Sydney; Dr. Victor Sanchez, Director General of Statistics, Guatemala; Royal Geographical Society of Australasia, Brisbane; Sociedad Mexicana de Geografia, Mexico.

On the receipt of the letter copied below, these communications were sent to Lady Lousia Egerton.

St. George's Hill, Byfleet, Weybridge, January 24th.

DEAR SIR,—I should be very pleased to see the letters you mention. The great sympathy which has been shown has been a real comfort in this sorrow.—Yours very sincerely,

(Signed), LOUISA EGERTON.

Letters from the Liverpool Geographical Society, thanking the members for their congratulations, from Mrs. Schofield, acknowledging the vote of condolence on the death of her husband, from the Imperial Russian Geographical Society announcing the death of its President, the Grand Duke Constantin Nicolayevitch, to which the Secretary was requested to convey this Society's condolence, and from the Principal of Owens College, were read.

The Owens College, Manchester, 19th January, 1892.

DEAR SIR,—I am desired by the Council of this College to request you to inform the Council of the Manchester Geographical Society that their very liberal offer of a contribution of Fifty Pounds for three years towards the establishment of a Lectureship in the Political Geography at this College, has been gratefully accepted by the Council of this College, and to request you to express to your Council sincere thanks for their munificence.

I am desired at the same time to thank you and the Secretary of the Society very warmly for your good offices in this matter.—I remain, etc.,

(Signed), A. W. WARD.

The Rev. S. A. Steintal.

The Secretary gave a lengthy description of the places it was proposed to visit during the summer. A large collection of new lantern slides was shown on the screen.

The death of Mr. H. W. Bates, Assistant Secretary of the Royal Geographical Society having been announced, it was proposed by Mr. T. DENTITH, seconded by the Rev. Canon SYMONDS, that the deep sympathy of this Society be tendered to Mrs. Bates.

Thanks to the Chairman brought the meeting to a close.

The 198th Meeting of the Society, held in the Memorial Hall, March 2nd, 1892, at 7-30 p.m. The Rev. S. A. STEINTAL in the chair.

Mr. E. DELMAR MORGAN, F.R.G.S., addressed the members on "The Early Discovery of Australia." The address was illustrated by a number of lantern slides prepared by the Victorians and was listened to with great attention.

Mr. W. D. PITCAIRN, F.R.G.S., moved a hearty vote of thanks to Mr. Morgan and gave some interesting reminiscences of Northern Australia, and the Rev. L. C. CASARTELLI, M.A., Ph.D., seconding the motion, it was carried with applause. Mr MORGAN responded.

The following courteous letter from M. Ch. Gauthiot, inviting our members to any of their meetings, was read and received with much pleasure.

"Société de Géographie Commerciale,
5, Rue de Savoie, Paris, 29. II. 92.

MONSIEUR ET CHER COLLÈGUE,—J'admire vraiment votre activité et estime fort haut les services que vous et votre société rendez à la Géographie appliquée. Vos ordres du jour me font venir l'eau à la bouche. Aussi vous prie-je, si tel de vos collègues, venant à Paris, voulait se faire entendre, soit dans nos sections où l'on cause et l'on interroge, soit dans nos séances générales où l'on discute, de me l'adresser. Il recevrait bon accueil. Agréez, je vous prie, l'assurance de mes meilleurs sentiments.

(Signed), GAUTHIOT."

Thanks to the Chairman closed the meeting.

The 199th Meeting of the Society, in conjunction with the Chamber of Commerce, held in the Mayor's Parlour, Tuesday, March 8th, 1892, at 3 p.m. In the absence of His Worship the Mayor, Mr. J. THEWLIS JOHNSON, President of the Chamber, took the chair.

Capt. A. J. MOUNTENY-JEPHSON, one of Stanley's officers, addressed the meeting (using a large map in illustration) on

"TRADE PROSPECTS IN UGANDA AND EAST CENTRAL AFRICA."

Mr. JEPHSON said it seemed to him that in Africa the European trader must necessarily, like the Arab trader, be a teacher as well, for what Africans required most to be taught was to improve their social condition, so that wants would be created amongst them which could easily be supplied by the labour of their hands and by the natural products of the country, which they could exchange for manufactured articles of commerce which they were unable to obtain for themselves. Trade and philanthropy must always to a certain extent go hand in hand in Africa. Anyone reading the history of the march of civilisation in Africa must be struck by the fact that most of the important and lasting benefits to civilisation in Central Africa were due to trade. The British East Africa Company, as they all knew, was largely composed of Scotch and English gentlemen whose philanthropic instincts were as proverbial as their instincts for business and commerce. He held that any philanthropy to be true and lasting must be based upon mutual interest. At present the eyes of everyone interested in Central Africa were turned towards Uganda, that country which lay to the north of Lake Victoria Nyanza. It was a country which had an average altitude of some four thousand feet above the level of the sea. They would therefore understand that it was healthy and not excessively hot as compared with India or Australia. It was a fertile country, with a rich soil capable of growing almost everything, and it was at one time the richest and best-governed country in Central Africa. Speke, Grant, Stanley, Emin Pasha, Mackay, and almost every traveller who had visited it spoke enthusiastically of its climate, its people, and its capabilities, and said that it was the country of the future in connection with Equatorial Africa. A glance at the map was sufficient to enable one to understand the value of its position on the great highway through which the trade of the rich countries of the interior must pass on its way to the coast. It might be considered as much the key to the rich countries of Central Africa as the Suez Canal was considered the key to India. Some day, if only from its natural position and healthy climate, it would become the great up-country depôt and mart for British trade in East Africa. But Uganda had other advantages besides its position and climate. It had an indigenous growth of coffee, which grew wild in great abundance, and if cultivated properly would be equal to the best Ceylon coffee. This was important when it was remembered that for many years the coffee crop in Ceylon, upon which we used to rely so largely in Great Britain, had entirely failed, and that our supply from Brazil and other countries also showed signs of giving out, owing to a disastrous leaf disease called *hemelia vastatrix*. Specimens of the wild coffee from Uganda had been sent to Europe, and had not found favour with connoisseurs, but this was not through the fault of the bean itself, but because of the way in which it was cultivated, and ignorance of the proper way in which it should be cured. The people in Emin's province, being chiefly Turks and Egyptians, were large consumers of coffee, their chief supply of which came from Uganda and the countries round the lakes. They all spoke highly of its quality. Tea also, though not indigenous to Uganda, flourished under the same conditions of soil, altitude, and climate as coffee, and might therefore be grown successfully in the high countries of the interior. Our chief supply of ivory,

too, must find its way from Uganda to the coast. For many years Uganda had been the great depôt and channel for the ivory which had been collected in the countries lying to the west of the White Nile. He was not one of those who considered ivory as likely to be the most important export from Africa, but would consider it rather as a minor, though exceedingly lucrative, factor in African trade. The greater part of African trade products would, he believed, come, as they should, from the soil, and this could only be developed with the opening up of the country. Ivory some people said was a product which would soon be exhausted. He could not agree with them in that, judging from the immense herds of elephants he saw in Emin's province and in the forest countries lying about it, which were included in the sphere of British influence. He predicted that when the country was developed one of the chief industries would be the making of oil. Ground nuts, from which the oil was made, grew in wonderful profusion. By the cultivation on a large scale of oil-bearing plants a very large trade in oil might be organised, and this might be made a powerful factor in settling and civilising the countries of the interior, by teaching the natives that by labour they could very materially increase their comfort. The growing of tobacco, too, might be developed into a considerable trade. Throughout the whole of their march from the west to the east coast they found the natives cultivated tobacco everywhere. They knew its use well, but were ignorant of the way in which it should be prepared. But the product which he ventured to prophesy would be at some time the great product of Africa was cotton, which was at present grown in great quantities. When they arrived almost naked in Emin Pasha's province they found all his people clothed in flowing white and brown robes of cotton cloth, which they themselves had manufactured from the cotton grown in the country. It was so prolific that a comparatively small acreage supplied all their wants. So plentiful was the crop that in a good year half of the raw cotton which was grown was never woven into cloth, as there were no mills in which to manufacture it, and it was entirely made by hand, in the very roughest and most primitive of looms, which was a very slow process. The cotton grown was of a fine, silky, oily description, and was particularly long in staple. The cloth into which it was woven was of a strong, soft texture, and was almost as warm as flannel. He showed some of the cotton cloth the other day to some cotton manufacturers in Blackburn, and they pronounced it to be of a very fine quality. From the seeds of the plant very good oil for ordinary purposes could be obtained, and the cotton cake thus formed made excellent food for domestic animals. The raw cotton which might be exported from Central Africa into England, if the cultivation of the cotton plant were properly developed, would entirely free England from being dependent for her raw materials on other countries, with their M'Kinley Bills and other such abortions, and much of the raw material might be returned to Africa in the shape of manufactured cotton cloth. They must understand that the remarks he had made about the cultivation of these different products in Uganda applied equally to the high inland countries in Central Africa on the White Nile and round the lakes, and even to many countries in the British sphere of influence which were close to the coast. The cultivation of grain, such as Indian corn, dhurra, millet, and other kinds of cereals, as well as rice, was capable of extension to an almost unlimited extent. Wheat was also grown by Emin Pasha in certain tracts of heavy land, and its growth was attended with considerable success. Of the natural products of East and Central Africa india-rubber would be one of the most important. This ought to prove interesting to people in Manchester who were engaged in the india-rubber trade. There was a large and fast growing want for a more extensive supply of india-rubber, and from what he had seen of the product he considered it to be of good quality. The trade in ostrich feathers was also

capable of considerable extension if properly organised. The country was also rich in mineral resources. He had spoken of the probable exports from Central Africa. With regard to the import of manufactured goods from Great Britain, he must say he would like to see a better class of goods sent into Africa than the cheap cotton cloths and tawdry ornaments now offered to the natives as examples of British manufactures. "The better the goods the better value can be obtained from the natives," as Captain Lugard said. Owing, however, to our wretched means of transport, the weight of the better class of goods practically prohibited their importation into the interior, as they would understand when he said that the cost of taking an article about five hundred miles into the interior was five times as much as the value of the article itself. That Central Africa was not a far better field for enterprise and commerce than it was at the present time was entirely because of the want of railways and extended means of transport. In addition to opening up trade, the placing of a steamer on the Victoria Nyanza would do more to stop the slave trade in one year than had been done during all the years we had been trying to put it down. If only the Government would give a portion of the money which it spent annually on its navy on the East Coast, which was kept there for the suppression of the slave trade, towards providing a guarantee for the railway from the coast to the great lakes of the interior, which could then be utilised and navigated by steamers, a few years would probably suffice to stamp out slavery throughout the extensive territory of British East Africa. Nothing of any importance would be effected so long as operations, either on land or sea, were confined to the coast. It was in the heart of Africa that the slave raids were made. What we wanted, therefore, was a means of reaching that part of Africa quickly and cheaply. What was necessary now was to produce a strong public feeling, so strong that no Government would dare to ignore public opinion by refusing to take the most effectual means of putting down the slave trade, and in its place enable British trade to be built up. He would remind them that the proposed railway had nothing directly to do with the Imperial British East Africa Company. Such a railway would indirectly assist that Company, no doubt; but the making of the railway was first suggested by the declarations of the Brussels Conference as a means of suppressing the slave trade and opening up markets for manufactures. If the railway was made, and a Government guarantee of two millions at a moderate rate of interest for a limited number of years was granted to it, it must be carried out by a separate organisation, quite independent of the Chartered Company, and controlled by men acquainted with railway administration. Personally, he had not the slightest interest in the British East Africa Company, and did not care in the slightest who held the territory as long as the people who held it were honourable and straight-dealing, and that he believed the British East Africa Company to be. He could wish that the British East Africa Company had a little more vigour and more initiative qualities. Still, he recognised that they were the people who held that country as the trustees for the Empire, and they were the people, therefore, who should be backed up for the good of Africa and for the extension of British trade. He regretted the decision of the Manchester Chamber of Commerce with regard to this matter. The Chambers of Commerce represented the voice of the commercial classes, who were the backbone of the Empire. To them, therefore, all who were interested in South Africa looked to strengthen the hands of whatever Government might be in power to carry out what at the Brussels Conference this country recognised as its duty.

On the motion of Mr. HENRY LEE, seconded by Mr. S. OGDEN, a vote of thanks was accorded to Mr. Jephson for his interesting and instructive address.

Mr. JEPHSON, in acknowledging the compliment, referred to a statement made in the Parliamentary debate to the effect that, according to Captain Lugard the slave

trade practically did not exist in Uganda. He said that although there might not be a great amount of slavery in Uganda itself, Uganda occupied a very important position in relation to the slave trade, as the slave raiders came right away down from the north, through Uganda, to the coast.

Thanks to the Mayor for the use of his Parlour, and to Mr. Thewlis Johnson for presiding, concluded the proceedings.

The 200th Meeting of the Society, held in the Library, Monday, March 21st, 1892, at 7-30 p.m. Mr. B. O'CONNOR took the chair until the arrival of the Rev. S. A. STEINTHAL.

The Minutes of Meetings held February 26th (197), March 2nd (198) and 8th (199) were read and approved, the presentations to the Library were announced, and correspondence was read from Mrs. H. W. Bates, thanking the members for their resolution of sympathy, from the Owens College in reference to the lectureship in geography, from Mrs. May French-Sheldon, and from Messrs. Bond and T. Stevenson, at Ibadan, Lagos (through the Rev. T. Champness), who had succeeded in passing through the territory blocked by the Egbas.

The election of the following members was announced :—

ORDINARY : Messrs. Harold Berry (in lieu of Associate), James Booth, J.P., William Bratby, J.P., John H. Brown, Henry Goldsmith, John Knowles, Elliot L. Lord, Herbert Philips, J.P., Mrs. Herbert Philips, Mr. Exham Phillips, Mrs. Exham Phillips, Messrs. T. C. Ramsbottom, G. W. Simpole, J. Slinger, and Robert Steele.

ASSOCIATES : Miss Fletcher, Mr. James Hollins, Dr. U. A. Jackson, F.C.S., Mr. James Kirkham, Miss Pendlebury, Messrs. Andrew Pendlebury, jun., Edward Pendlebury, and Alfred Walker.

The death of Mr. Edward Ross having been made known, the Secretary was requested to convey the condolence of the Society to his family.

The death of Mr. Oliver Heywood, one of the vice-presidents of the Society, was announced. The meeting desired the Secretary to tender to his family the great sorrow felt at his death, and to record the respect held for him by the Society.

The following communication was read from Mr. W. D. Pitcairn, F.R.G.S., on New Guinea, &c. :—

KANAKA LABOUR.

Eccles Vicarage, March 7th, 1892.

Dear Sir,—In the "Journal" for quarter ending March, 1891, there is a review of my book, the introductory chapter of which is devoted to Queensland. On page 17 I pointed out very strongly the fatal effects the policy of the Government, in prohibiting for the future the importation of Kanaka labour, would have on the sugar industry, which industry is the mainstay of the country. My warning has been fully justified. Only a fortnight ago Sir W. S. Griffiths, Premier of Queensland, and until recently one of the bitterest opponents to the importation of Kanaka labour, summoned a special meeting of his colleagues so that he might lay his views before them. Although he feared he was open to a charge of inconsistency, he recognised the urgency of the case, and impressed upon his hearers the necessity of permitting the importation of Kanaka labour from the South Seas for a period of ten years. This, he stated, was the only means of bringing back prosperity to the Colony and of preventing the collapse of the industry produced by the closing of the large mills. You

may be interested to hear the latest news from New Guinea, which I obtained from a friend of mine who has just arrived from that country. In the Island of Sud-Est (Louisiade Archipelago), a gold-bearing reef has been discovered. The claim is called "Hula," P. C. It is the property of nine men. The stone from the reef, which shows gold on the surface, was sent to Charters Towers, Queensland, for assay, and the returns to hand give 32ozs. 12dwt. to the ton. There is extraordinarily rich quartz, and it is most encouraging. As suggested in my address to the members of the Society in April, 1890, I have no doubt that eventually New Guinea will prove rich in minerals. The following may also be interesting from a geographical point of view. I read, a couple of months ago, an account of the finding of a sunken treasure-ship by pearl divers in Torres Straits. The ship was a Spanish merchantman of a bygone age. In it the divers discovered thousands of pounds in Spanish silver coin. I do not know the exact date of the coins, but it was before Cook's time. I hardly believed the account, but my friend, who came home *via* Torres Straits and touched at Thursday Island, confirms it in every particular. To those members who are interested in missionary work it will be gratifying to know that missionaries are spreading over New Guinea like mushrooms.—I am, &c.,

(Signed) W. D. PITCAIRN.

NEWALA AND EAST AFRICA.

The Rev. W. C. PORTER, M.A., exhibited maps of Newala and a large and interesting collection of curiosities and natural products. He addressed the members, and, in reply to questions, gave several most graphic descriptions of life in German East Africa, and indicated his opinion that the Makonde plateau was destined to be a very rich and important centre of influence and was not unhealthy for Europeans. His addresses were listened to with great attention. Mr. Porter presented the Society with a collection of specimens of forest woods and a map of the district prepared from his information by Mr. Warren. A very hearty vote of thanks was given to Mr. Porter for his kindness in attending the meeting.

Mr. R. C. PHILLIPS gave on his violin some examples of West African music, and the meeting closed at a very late hour.

The 201st Meeting of the Society, held in the Library, Wednesday, March 30th, 1892, at seven p.m. Mr. HERBERT PHILIPS, J.P., in the chair.

The Minutes of Meeting held March 21st (200) were read and approved, the arrangements for April were announced, and the Easter and Whit-week excursions were referred to.

Mr. J. HOWARD REED addressed the members on "The Discovery and Exploration of the Congo" (see page 26). The address was illustrated by a large map specially constructed for this meeting by Mr. Reed.

A communication from the Fifth International Congress on Inland Navigation, to be held in Paris in 1892; and a letter from Messrs. Wainwright and Sons, of the Grand Trunk Railway Company of Canada, conveying about sixty slides of Canadian scenery, were read.

The following from the Rev. Canon Heywood, M.A., was also read:—

22, Upper Montagu Street, London, W., March 24, 1892.

My Dear Sir,—Allow me most sincerely to thank you, and the members of the Geographical Society, for the much-valued expression of your regard and love for my brother, Mr. Oliver Heywood. Your letter shall, on my return home, be shown to

my brother, Sir Percival Heywood, and I am very sure he will value it as much as I do. We all shall value it. Expressed sympathy is, I can assure you, just now valued very much indeed. Our family is thinning in this world. In 24 years, three gone. Thank you sincerely for writing, and thank—if you will be so good—those who asked you to write on their behalf.—Yours most gratefully,

(Signed) HENRY R. HEYWOOD.

The announcement, communicated by the Principal (Dr. WARD), of the appointment of Mr. H. Yule Oldham as Lecturer on Political and Commercial Geography at Owens College was received with satisfaction.

The death of one of the oldest members of the Society, Mr. John Hudson, having been announced—it was resolved that the Secretary be requested to convey to the family of Mr. Hudson the regret and condolence of the members at his death.

Thanks were given to Mr. Reed for his address and to the Chairman, which being responded to the meeting closed.

REPORT OF THE "VICTORIANS" TO THE COUNCIL OF THE SOCIETY ON THEIR WORK, 1891-2.

Ladies and Gentlemen,—Since the last report presented to the Council the "Victorians" have been hard at work giving lectures and addresses and preparing the analysis for the journal.

Some forty lectures have been delivered on the different subjects mentioned in the list sent out to the members. Of the lectures five were given under the auspices of the Working Men's Clubs Association, at Preston, Mossley, Oldham, Styal, and Reddish; two for the Wakefield Mechanics' Institution on "Commercial Geography," and "Across Africa with Stanley;" and the rest for members at Burnley, Leigh, Stretford, Urmston, Oldham Free Library, Whaley Bridge, Farnworth, Middleton, Northwich, &c.

In all places either the lantern, or maps and diagrams have been used, and great interest has been shown by large audiences.

The "Victorians" again gave an entertainment to the children of members belonging to the Society, and this was, as in the previous year, a great success. They have also given lantern entertainments and addresses for the Adelphi (Salford) Lads' Club: Cheetham Hill Mission; Charter Street, Varley Street (Oldham Road), and Pendleton Ragged Schools.

A map, which received the highest praise for its workmanship, was made for Mrs. Sheldon to illustrate her journey in the Kilimanjaro district, and has been used by her in places where she has given lectures.

The "Victorians" are proud to belong to and to work for this Society. They rejoice that it is making so great a mark in the community round Manchester.

CHARLES W. GRINDLEY.

THE REPORT FOR THE YEAR 1891 OF THE SECRETARY TO
THE COUNCIL ON THE WORK OF THE SOCIETY.

THE work of the Society during the year 1891 has been persistent and arduous. Meetings have been held which have been largely attended, and a large amount of interest has been evoked amongst the members and amongst others who are not yet members of the Society. There were forty-three meetings of one kind or other, and the details of information given thereat are as follows :—

Addresses were given, papers were read, or communications made to the members on

EUROPE.

The Channel Tunnel. Professor Boyd-Dawkins, M.A., F.R.S., &c.
Swedish Embroideries.

The Causes of the Cevennes. Mr. M. Stirrup.

Ireland : History, Geography, Resources, and Picturesqueness. The Secretary.

The Ethnology of Etrusca, Sardinia, and Sicily. Professor Borsari.

The Cheshire Rhine ; Northwich Salt Mines ; The Anderton Lift. Addresses by Mr. J. A. Saner, Mr. T. Ward, and others.

Berne and Switzerland. The Chairman of the Council, Mr. M. Stirrup, F.G.S., and the Secretary.

ASIA.

Secret Societies in China. Mr. F. H. Balfour.

The Journey of M. Bouvalot and Prince Henri of Orleans Across Thibet. Mr. M. Stirrup, F.G.S.

Armenia. Professor Minassé Tcheraz.

British Trade in Central Asia. Professor Arminius Vambery.

The Height of Mount Ararat.

The Siberian Rivers. Prince Kropotkin.

Impressions of Travel in India. Mr. C. E. Schwaun, M.P.

The Recent Progress of Indian Agriculture. Mr. C. L. Tupper.

Railway Communications of India. Mr. W. C. Furnivall.

Recent Trade Progress and Competition in India. Mr. D. A. O'Gorman.

The Causes of Chinese Emigration.

Japan. Mr. W. M. Steinthal.

India : Country, People, Resources, &c. The Victorians.

The Ruby Mines and Oil Industry of Burmah.

Japanese Art. Consul Bowes, of Liverpool.

AFRICA.

The Pygmies of Africa. The Secretary.

Yoruba. Mr. Alvan Millson, M.A., F.R.G.S.

The Commercial Products of Central Africa. Mr. J. Howard Reed.

Mr. F. S. Arnot's Progress in West Central Africa.

Lake Chala.

Zululand. Miss Colenso.

The Ancient Language of the Natives of the Island of Teneriffe. The Marquis Bute, K.T.

Christian Missions in Africa. Dr. R. N. Cust.
 Across Africa with Stanley. Four Lectures by the Victorians.
 The Great Lakes of Central Africa. Mr. J. H. Reed.
 The Nile. Mr. J. H. Reed.
 England's Expansion in South Africa. The Secretary.
 The Mediterranean: A Study in Comparative Geography. The Secretary.
 Five Years Among the Congo Cannibals. Mr. Herbert Ward.
 Gazaland. Mr. Dennis Doyle.
 A Lady's Journey to Kilima-njaro and Lake Chala. Mrs. May French-Sheldon.

AMERICA.

The Fourth Centenary of the Discovery of America.
 Continental Celebrations of the Fourth Centenary of the Discovery of America—
 Madrid, Huelva, Lisbon, Genoa.
 The American Celebration at Chicago.
 Mexico. Mr. F. G. Burton.
 The River Beni. Chevalier Guillaume.
 The Sources of the Mississippi River. Mr. J. V. Brower.
 The West Indies: History, Geography, Natural Resources, Trade, and the Value of
 the Islands to Great Britain. Major Ballantine.
 Boulder Outline Figures in the Dakotas. Mr. T. H. Lewis.

AUSTRALASIA.

The New Zealand of To-day. Mr. J. Murray Moore, M.D., F.R.G.S.
 The North-east Coast of New Guinea and some of the Adjacent Islands.
 Mr. J. P. Thomson, F.R.S.G.S.
 The Ascent of Mount Yule. Mr. J. P. Thomson, F.R.S.G.S.
 Antarctic Research. Mr. E. Delmar Morgan.
 The Early Discovery of Australia. Mr. E. Delmar Morgan.

COMMERCIAL AND GENERAL.

The Honey Bee. Rev. T. Slevan.
 The Children's Home on The Moors at Edgworth.
 Geography in Newspapers and Periodicals. The Secretary.
 Practical Suggestions Offered to Travellers. Mr. J. P. Thomson, F.R.S.G.S.
 The Art of Observing. Mr. John Coles.
 The Pronunciation of Geographical Names. Dr. Ganzenmüller.
 Reports of the Delegates to the International Congress of Geography at Berné, the
 British Association, and the Yorkshire Mechanics' Institutes Union.
 Commercial Geography. Mr. Gwyn Morris
 Railway Time.
 Reports on the Examination in Geography, "Lancashire and Cheshire."
 Reports of the Various Excursions of the Members of the Society.
 Biography of Mr. J. F. Hutton.
 The Geographical Work of Mr. J. P. Thomson, F.R.S.G.S. of Brisbane. The Secretary.
 Astronomy in Relation to Geography. Mr. T. Weir.

CORRESPONDENCE.

Mrs. Moir—On Nyassa Lands Exploration.
 Miss Colenso—On Zululand.
 Mr. R. E. Dennett—On Congo Matters.

Mrs. Brayne—On the Work of Captain Lugard.
Mr. J. P. Thomson—On Australia and New Guinea.
Dr. Ganzenmüller—Geographical Education.
The Marquis Nadaillac—Intelligence and Instinct of Animals.

GEOGRAPHICAL SOCIETIES.

Rochefort—The French National Congress of Geographical Societies.
Berne—International Congress of Geography.
Washington—International Congress of Geologists at Washington.
Liverpool—Foundation of a Geographical Society.

Letters have been received announcing the deaths of
Professor Borsari, Naples ;
Lieut.-General J. B. J. Liagre, President of the Royal Belgian Society of Geography ;
Monsieur de Quatrefages de Bréau, Member of the Institute, and President of the
Society of Geography of Paris.

MEMBERS OF THE SOCIETY DECEASED IN THE YEAR 1891.

The death-rate in our own Society has been very heavy. We have lost some active and valuable members, among whom are—

His Grace the Duke of Devonshire, K.G.
Councillor J. H. Butterworth, Salford.
Edward Cross, Esq., Bolton.
Hon. Algernon Egerton.
Mr. Anyon Duxbury, Salford.
Mr. Thomas Elston, Bury.
Mr. John Jackson, Manchester.
Mr. William Jones, Ashton-on-Mersey.
Mr. G. T. Kay, Salford.
Mr. E. S. Schwabe, Rhodes.
Mr. James Wilding, Manchester.
Mr. C. Wadsworth, Newton Heath.

The excursion meetings of the Society have been of varied interest, and the members look for them with great keenness.

Some of the members have been aided in Continental and American travel, in addition to the home journeys, and these have been productive of pleasure and profit.

Journals 7 to 9, 10 to 12, for 1890, and 1 to 3 for 1891 were published during the year—the first-named being for us a great undertaking, and a *Journal* which was eagerly sought after, and is now out of print.

It would be well if by any means the *Journals* could be more promptly published, but unless the Society increases its membership or obtains funds in some other way this cannot be done.

The Victorians have sent a special report, and all that need be said of them is that the Society owes them a debt of gratitude for their self-denying and valuable labours.

The balance-sheet has been audited, and is herewith presented.

The Council suggests the addition to Rule 19 of a clause to the effect—"that any member of the Society being two years in arrear with his subscription shall not be entitled to receive any copies of the *Journal* until his arrears be paid."

REVENUE ACCOUNT.

JANUARY 1st, to DECEMBER 31st, 1891.

[illegible]

VICTORIA UNIVERSITY GEOGRAPHICAL LECTURES FUND ACCOUNT.

Dr.				Cr.
To Donations Received—	£	s.	d.	
Mr. B. Armitage, J.P.	5	0	0	
Rt. Hon. A. J. Balfour, M.P.	5	0	0	
Mr. James Parlame, J.P.	2	2	0	
	12	2	0	
	<hr/>			
	£12	2	0	

GENERAL BALANCE ACCOUNT, DECEMBER 13th, 1891.

ASSETS.		£	s.	d.	LIABILITIES.		£	s.	d.
To Arrears of Members' Subscriptions.....		291	18	0	By Thirteen Life Membership Subscriptions in Reserve ...		136	10	0
" Stock of Journals		63	0	0	" Subscriptions Paid in Advance		33	1	6
" Lantern and Slides Account—					" Geographical Lectureship Fund		12	2	0
Balance, 1890	£20	2	1		" Sundry Accounts Outstanding ..		287	13	5
Expenditure	4	10	6						
	24	12	7						
Less received from "Vic- torians"	4	12	7						
				20					
Amounts Charged on Account of 1892 :—									
New Members	10	0	0						
Examinations	5	15	7						
Library	6	6	0						
				22					
Cash in Hand, General Account :—									
Treasurer	10	10	10						
Secretary	19	19	10						
				30					
Cash in Bank, Lectureship Account				12					
Balance of Deficiency, 1890.....	30	15	2						
Less Balance of Revenue Account, 1891 ..	1	0	6						
				29					
				14					
				8					
				£469					
				6					
				11					

Audited and found correct,

 THEODORE GREGORY, F.C.A.,
 WILLIAM ALDRED, F.C.A., } AUDITORS.

September 12, 1892.

REPORT ON THE SOCIETY'S EXAMINATION ON "INDIA,"

1892.

ABOUT 2,000 circulars of invitation to School Boards, Private Schools, Colleges, Grammar Schools, Mechanics' Institutions, and Evening Classes in Lancashire, Cheshire, and Yorkshire were issued :

(COPY OF CIRCULAR.)

PRIZES AND CERTIFICATES FOR 1892 EXAMINATION.

The subject for Examination for Prizes and Certificates of the Manchester Geographical Society for next year will be

THE GEOGRAPHY OF INDIA.

The following Syllabus will be of use as a guide to the children who are intending to present themselves for Examination :—

The children in any Board School above the 7th Standard, in Private Schools, Grammar Schools, or Secondary Schools, in Lancashire, Yorkshire, and Cheshire, may compete.

The Examinations will be in writing, and the Examination for Lancashire and Cheshire will be taken by the Lancashire and Cheshire Institutes Union, and for Yorkshire by the Yorkshire Mechanics' Institutes Union in their ordinary examination.

The Questions to be answered will be given out to the children by the Examiners, who will be present the whole time of the Examination.

No notes, text-books, or other aids may be used at the Examination.

The Papers will be adjudicated upon by two members of the Council of this Society.

Five Prizes of £1 each, and Ten Prizes of 10s. each, will be given and the Certificates of the Society.

SYLLABUS.

INDIA.

I. The Land, Water, and Air.

- (a) Position, Surface, Size, Shape, and Boundaries.
- (b) Mountains, Himalayan Glaciers, Plateaus, The Tarai, Lowlands, Jungles Deltas, the Sunderbunds, &c.
- (c) Seas, Lakes, Marshes, Lagoons ; Rivers, their Rise, Course, and Basins ; their Mouths and Estuaries.
- (d) The Climate ; Monsoons and other Winds, their General Rise and Course ; Rainfall and Heat. The extremes of Rain and Heat particularly to be noted.

II. The Natural Riches of the Country.

- (a) Mineral Wealth ; the Geology of the Country ; Mines, Quarries, Mineral Oil Springs, Coal, Iron, Salt, Diamonds, Gold.
- (b) Agricultural Wealth ; Food Products, Medicinal Products, Products used in the Arts for Dyeing, &c. ; Industrial Products, Cotton Growing Jute, Quinine, Tea, Wood Work, Metal Work, Textiles, &c.

III. The People of India.

- (a) A Short History of India.
- (b) The Principal Races of India ; their Origin and Distribution.
- (c) The Homes of the People.
- (d) Social Conditions, "Caste," Widowhood, Child-Marriage, &c. ; The Cities, Towns, and Villages.
- (e) Religions ; Brahminism, Mohammedanism, Buddhism (Ceylon and Burma), Jainism, Parsism (Bombay).
- (f) The Political Divisions ; British Territory, French and Portuguese Territory, States under British Administration, Independent States ; the States which are mainly Mohammedan, Hindoo, Jain.
- (g) The Government of the several kinds of States as in Section C. Municipalities of India Village Community and Order.

IV. The Trade of the Country.

- (a) Industries, or the Production of Commodities.
- (b) Commerce, or the Exchange of Commodities.
- (c) Silver and its Fluctuations in Value, and its effect on the Commerce of India.

A competent knowledge of Section I., and of at least two of the other Sections will be required of all candidates for a Certificate.

BOOKS SUGGESTED FOR REFERENCE.

Collins' Indian Popular Atlas.
Ruddiman Johnston's Oriental Atlas.
Keith Johnston's Geography (Physical, Historical, and Descriptive).
Gill's Students' Geography.
Meiklejohn : The British Empire.
Dr. Yeat's Manuals of Commerce. 4 vols.
The Golden Gates of Trade.
Map Studies of the Mercantile World.
G. Smith : Political and Physical Geography of British India.
J. Strachey : India.
Cyril Ransome, M.A. : Our Colonies and India.
Hunter's Imperial Gazetteer. Vol. VI. "India."
Bluebook : Condition of the East Indies, with Trelawny Saunders' Maps.
The Statesman's Year Book.
Whitaker's Almanack.
Financial Reform Almanack.

Professor Boyd Dawkins, Professor T. H. Core, and the Rev. L. C. Casartelli acted as examiners and set the Examination Paper.

The Lancashire and Cheshire Institutes and the Yorkshire Mechanics' Institutes Unions very kindly consented to take the examination for the Society.

The Yorkshire portion of the work was not satisfactory.

About 320 applications were made by persons wishing to take part in the examination, about equally divided between the two Unions.

The result was that a total of 103 persons did actually sit, 98 in Lancashire and Cheshire, and five in Yorkshire.

The date of examination was altered to suit the convenience of the Yorkshire Union, but the result was disappointing.

The special subscription made has been sufficient to pay the actual expenses of the examination, and a portion of the money has been placed to the fund for the Lectureship at Owens College.

The following are the questions and conditions of the examination. Two hours was the time allowed for the answers to the questions:—

GENERAL INSTRUCTIONS.

If the Rules are not attended to, the Paper will be cancelled.

You must take Sections I. and V., and at least two of the other Sections.

Put the number of the question before your answer. You are to confine your answers *strictly* to the questions proposed.

Your name is not given to the Examiners, and you must not write it on your Papers.

QUESTIONS.

I.

1. Make a Sketch-map of India and Ceylon, indicating the Chief Mountain Ranges and Rivers.
2. What do you understand by *The Tarai, The Sunderbunds, Jungles, Doabs?*
3. Describe the Course of the Two Principal Rivers of India.
4. What are the *Monsoons* and their Effects? Give some Account of the Extraordinary Features of the Rainfall in India.

II.

1. Describe the Chief Mineral Riches of India and Ceylon, and the Localities where they are found, especially Precious Metals and Stones, Coal, Iron, Salt, and Mineral Oil.
2. What are the Grain Products of India? Say what you know about the Production of Tea, Coffee, Quinine, Indigo, Teak, and Jute.
3. Give some Account of Indian Silk Production and Silk Manufacture. What is Tussur Silk?
4. Describe the Growth, Export, and Manufacture of Cotton in India. Also give some Account of the History of the Cotton Trade in that country.

III.

1. Describe the Principal Peoples of India, and their present Distribution.
2. What do you understand by Caste, Pariahs, Suttee, Child-widows, the Mofussil, Banyans, Coolies?
3. What are the Two Great Religions of India proper? What is the Religion of the People of Ceylon and Burma? Who are the Parsees?
4. What are the Political Divisions of the Indian Empire and Ceylon, and how are they Governed? What is the Total Population? What Parts are the most Densely Populated?

IV.

1. In what Industries do the Natives of India and Ceylon excel?
2. What Trade does India carry on with the United Kingdom, China, Australia, and other Countries?
3. What is the *Rupee*, and what has been its Value at different times? What is at present about the Value of ₹10,000, and what the Value in Rupees of £150?

How do you read the following sums : R43,96,280 ; R10,68,02,550 ? What Coinage is in use in Ceylon ?

4. What is the Monetary Standard of India ? How is it that India, in spite of her standard, Consumes so much Gold ?

V.

Write a Short Essay on *one* of the following subjects :—

- (a) "The Value of India to England."
- (b) "The Duty of England to the Peoples of India."
- (c) "Railway Extension in India and Further India : Its Importance and Probable Results."
- (d) "The Mogul Dynasty in India."
- (e) "The Indian Mutiny."

L. C. CASARTELLI,	} <i>Examiners.</i>
T. H. CORE,	
W. BOYD DAWKINS,	

The average age of the persons examined was 15 years and 3 months.

The possible number of marks which could have been made was 46,350 by all those who sat.

The total number of marks actually obtained was 7,910.

There were of the 103 persons examined :

9	who were examined in all five Sections,
102	in the 1st Section,
69	in the 2nd Section,
65	in the 3rd Section,
29	in the 4th Section,
87	in the 5th Section.

The first prize was allotted to Beatrice Maud Briggs, of Armley, Leeds, 17 years old.

Second prizes were awarded to James E. L'Estrange, of Manchester, 31 years old ; and William B. Hough, of Over, near Winsford, 18 years old.

Certificates were granted for passing the examination to the three prize winners and to the following, who were not awarded prizes :—

- J. Herbert Ramsden, of Darwen, 19 years.
- Harry Hood, of Eccles, 14 years.
- Fred Ellison, of Manchester, 22 years.
- Carl Nightengale, of Darwen, 19 years.
- George W. Manley, of Manchester, 17 years.
- William Hy. Eason, of Manchester, 15 years.
- John Wild, of Lees, Oldham, 19 years.

The total number of marks obtainable for the five sections were 4,501.

No certificates were granted unless the candidate had obtained 150 or more, and prizes were awarded only to those who had obtained over 200 marks. The highest marks obtained were 225, and the lowest 23.

One of the examiners, the Rev. L. C. Casartelli, M.A., has submitted a special report, which is of great interest and value, and the result of considering the facts here stated and this report is that a great amount of work has yet to be done in schools and other places where geography is taught before that teaching can be considered to be of a sufficient and satisfactory kind.

SPECIAL REPORT OF THE REV. L. C. CASARTELLI.

I venture, for the interest of the subject itself, to present a few general observations on the results of the examination as a whole.

I. It is evident that a considerable number of candidates have been sent up who were entirely unqualified for presentation. This is sufficiently shown by the marks gained.

2. Some have lost time and credit by not attending carefully to the directions on the paper. This is especially the case in Section V., where only *one* short essay was to be chosen out of five subjects. Some have done all, or several. Credit can be given only for one.

3. Speaking generally, it has seemed to me that much better knowledge has been shown in the *physical* portions of the paper than in what I may term the more *human* side of the subject. Yet I am of opinion that, whilst the physical and natural geography is an absolutely necessary basis to the study of India, it is not easy to exaggerate the importance to the rising generation of this country—the future real rulers of the 260 millions of the Indian Empire—of a more accurate and sympathetic knowledge of those vast populations—their differences of race, character, religions, ideas, tastes, as well as the main facts of their history. On the whole, this is the weak side of the 103 papers under review.

(a) Not many give a satisfactory account of the “principal peoples of India and their present distribution” (III., 1). Some answers are remarkable, thus :—

“The principal peoples of India are the Parsees, the Jeans, the Hindoos, the Coolies.”

“The principal peoples of India are the Parsees, the Mazawattees [reminiscence of the tea shops !], Burmese, English, and Ceylonese.”

“The principal races are the Hindoos, Skites, and Parsees.”

“Hindoos are of a black kind of persons.”

(b) Still more inaccurately are many of the notions of the religions of the peoples of India (III., 3). Many still seem to think that Buddhism is one of the great Indian religions of the present day, though in India proper it has long been quite extinct. It is not generally known to the candidates that Ceylon and Burma, on the other hand, are thoroughly Buddhist. Here are some of their specimens :—

“The two great religions are Bramisuum and Bubisuum.”

“(The two great religions are) Iudoo and Bramicial. In Burma and Ceylon they worship idols, principally Vesuv Seava.” [?A reminiscence of the Brahmanic deities Vishnu and Siva.]

“The people of Ceylon are mostly Christians, and so are the Burmese.”

The following is an odd mixture, both geographically and historically :—

“Buddha is supposed to have died at Goa, near Calcutta.”

But the ones which come worst off among the peoples of India are that intelligent, highly educated, and philanthropic little race, the Parsis, of Bombay. Of course, the old calumny is continually repeated that they “worship fire,” that they “worship the sun,” and some even add the “moon and the stars,” or “earth and water.” But they get worse treatment than this. The Parsi merchants of Manchester would be surprised to read the accounts of

them and their religious views given by some of their juvenile fellow-citizens. We are told, for example—

"The Parsees are those who do not believe in a God."

"The Parsees or fire-worshippers are classed with the Atheists" (*sic*).

"The Parsees' . . . religion is very strange. Some of them live in the Towers of Silence."

"The Parsees are a people who don't believe in any religion, but have a religion of their own."

"The Parsees are a wandering set of people like the Jews ; they are fire-worshippers," &c.

To add to their misfortune, they get (apparently) mixed up in the juvenile mind with the Pharisees of the New Testament. This will explain the statement of several candidates that

"Parsees are the Priests."

And, also,

"The Parsees are those that think themselves higher than others."

A few candidates, however, have a good word for them, thus :—

"The Parsees are a good kind of people."

"The Parsees are good and just."

(c) A number of peculiar terms relating to Indian populations or customs (Section III., 2) come in for curious answers. Thus "caste," fairly well understood on the whole, gets some odd definitions, *e.g.* :—

"Caste is a mark on a person's forehead."

"Caste is a monogram which they have painted on their foreheads."

"Caste is the same as society."

Again, it is apparently believed by some that the cruel custom of *suttee* is still practised "nearly all over India !" The custom itself is variously and strangely defined.

"Suttee is a religion in which people are burned alive."

"Suttee, or child-marriage."

"If a husband died, his wife would have to have him burned, and she would have to be burned probably, or *wear uncomfortable clothes* the rest of her life."

In the following remarkable answer there is a charming medley of *suttee* and child-widowhood :—

"Suttee is the marriage of two persons when very young, and the female is to be burnt, that is, when she is grown up. When the female of the two children that are married dies, *then the male is a child-widow.*"

I may remark, too, that in the same question the term "banyan" (a native trader or broker) has been uniformly confounded with "banyan" (a kind of tree), though the context shows the latter could not be meant. The only exception is one candidate who (calumniously, let us hope) defines "banyans" as "robbers" (*sic*) !

It is not easy to give the *raison de être* of the following answer :—

Q. "In what industries do the natives of India and Ceylon excel ?"

A. "The way the people please themselves is that they have large doll parties and kite-flying."

(Is this an echo of China ?)

(d) Many mistakes are made about the value of the rupee. Hardly any have worked the simple sums given correctly. Not one is able to read the sums given in lakhs and crores (R13,96,280 and R10,68,02,550), although said figures may be seen frequently quoted in the business columns of the *Manchester Guardian*, and surely ought to be taught to English youths. Not one is aware that the Ceylon coinage is one rupee = 100 cents.

(e) The favourite essay is evidently the one on the Indian Mutiny, and a fair knowledge is shown on the whole. But it is alarming to find so many confusing the mutiny with the Black Hole of Calcutta, and Lord Clive with Clyde, and generally the events of 1757 with those of 1857. Also, to learn that "the Indian Mutiny was a battle . . . between the French and Portuguese against the English."

However, the gem of the whole 103 papers, which I have reserved for the *finale*, is the following "short essay" :—

The Duty of England to the Peoples of India.

"The duty of England is different to that of India. The people of India are very careful of what they do. When they are going to sit down they carefully brush the seat before they sit down for fear they should sit on any living insects, where the English people sit down and don't care whether they sit on insects or not."

We may conclude on the whole that the examination will have done considerable good in calling attention to our great Indian Empire and its teeming population, and, perhaps not least, by showing the serious deficiencies still existing, both in popular conceptions and in school teaching, regarding many subjects of the highest importance concerning them. Let us hope a very good effect may thus be produced in our great mercantile community.

July 7, 1892.

The "Grand" Falls, Labrador.—These magnificent falls, of which very little was known, and which the enterprising English traveller, Mr. R. F. Holme, failed to reach on his journey inland in 1887, were last summer visited by Mr. H. G. Bryant, of Philadelphia, accompanied by Prof. Kenaston, of Washington. The difficult land journey from the end of canoe navigation on the Grand River was successfully accomplished, and sufficient time spent at the falls to make accurate measurements, for which instruments had been supplied to Mr. Bryant by the United States Geological Survey, and also to make botanical and geological collections and secure a series of excellent photographs. The width of the falls was found to be 200 feet, the river contracting to this width from its previous expanse, half a mile back of 400 to 500 yards; the height of the perpendicular fall of water is 316 feet, but before the vast volume of water leaps over the edge it rushes down a series of slopes, which together make the entire descent 500 feet. Another party of explorers, of which Mr. Bryant heard only on arriving at Halifax, were in the field at the same time—Prof. Lee, of Bowdoin College, with some twenty students and graduates—and a visit to these falls formed a feature of their programme. The schooner in which they were embarked reached the mouth of Grand River first, and two of the students succeeded in reaching the falls a few days before Mr. Bryant. In an article on Mr. Bryant's expedition, contributed by Mr. M. Harvey to the *New York Tribune*, it is pointed out that the first white man who reached the falls was John McLean, of the Hudson Bay Co., whose journey was made in 1839, and an account of it published in a book, now rare, entitled, "Notes of a Twenty-five Years' Service in the Hudson's Bay Territory." *Proceedings of the Royal Geographical Society, January, 1892.*

THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

"CANADA AND THE GREAT NORTH-WEST."

BY MAJOR-GENERAL SIR FRANCIS DE WINTON, R.A., K.C.M.G.

[Addressed to the Members of the Society, at the Memorial Hall, Wednesday,
October 5th, 1892.]

(For Map, see p. 84, Vol. I.)

IT may appear somewhat presumptuous in me to attempt a lecture on so well-known a country as Canada, before so distinguished and so well-informed an audience as that of the Manchester Geographical Society, and I crave your indulgence for making the attempt; but I was so much struck with the material prosperity and progress the Dominion of Canada has achieved during the past ten years, especially in that portion of it to which my paper chiefly alludes, viz., the North-West, that, on my return from Canada last November, when your Secretary asked me to read a paper before your Society, I gave him the choice of two subjects, "Central Africa" or "Canada and the North-West," and he chose the latter.

In one respect, perhaps, he was wise, for Central Africa has, during recent years, received a very large amount of attention, and, being a very warm portion of our earth, it might be hinted that it was just now a little overdone.

Be that as it may, it must remain for a long time a most interesting subject—so much has yet to be discovered, so many problems have yet to be solved, and, judging from recent news, it bids fair to continue the battlefield between Paganism and the missionary, between Mohammedanism and civilisation, between lawlessness and order, between liberty and the slave traffic, as well as those commercial questions and considerations which are rising out of recent developments, and our better knowledge of the products of this vast region and their value in the European markets.

VOL. VIII.—Nos. 4-6—APRIL TO JUNE, 1892.

I would also venture to impress this fact upon your attention—that if my paper does not come up to your expectations, your Secretary, Mr. Sowerbutts, must accept the responsibility, because you see he has chosen the subject and I have only had to collect the materials. I am sure you will all agree with me.

You will observe that the title of this lecture is “Canada and the North-West,” and I do not propose to waste your time by any attempt to depict to-night this oldest and greatest of our colonies—its history or its development, political and commercial—but rather to lead you into wilder lands, into the growing and fertile regions of that great area which lies between the gigantic lake system of North America and the province of British Columbia—a territory bounded on the north by the Arctic regions, on the south by the line of demarcation between the United States of America (the 49° parallel), on the east by Lake Superior and the savage wilds which extend from its northern shore to Hudson Bay, and on the west by the Pacific Ocean. Through the kindness of Professor Dawkins we are furnished this evening with a large official map of Canada, and the Grand Trunk and Canadian Pacific Railway authorities have been good enough to lend us some photographic slides which will be exhibited at the end of my paper.

I am well aware that I cannot to-night tell you much that is geographically new as regards Canada; but I hope to be able to interest you in what might be termed the commercial aspect of the country and some of its more recent developments, which from their nature, as well as from being considered from a geographical point of view, are matters worthy of attention to a great wealthy commercial centre like Manchester.

This will be my theme this evening, and I shall endeavour to show you Canada as she is to-day—her enormous railway systems, and their rapid development; her rich wild lands only awaiting capital and labour, with intelligence, to develop into one of the great wheat-producing areas of the world; her fertile grazing lands, of what is generally called the ranche country, where already noble herds of horses, and cattle and flocks of sheep are being raised; her mineral wealth that lies hidden in the valleys of the Selkirk and Gold ranges, as well as towards the north, in what is known as the Peace River country; and the markets which are arising for these products both in the east and in the west. I hope also to be allowed to say a few words concerning the advantages which Canada offers for emigration and colonisation (these are matters of much importance as regards the future welfare of this great country), and they are within the scope of a paper on geographical economics.

There are three great railway systems in Canada—the Grand Trunk Railway, the Canadian Pacific, and the Inter-Colonial. The former has been in existence for many years. It has passed

through various vicissitudes, and the whole of the prosperity of the older portion of the colony—the provinces of Quebec and Ontario—had its commencement from the time of its construction. Previous to its establishment the sole means of transportation was by water, consequently for six months in the year the country was practically closed against European markets. Thus it had only a semi-existence, and it was impossible any material progress could be made under such a condition of affairs; and it was not until the Grand Trunk Railway came into operation that the commercial activities of the country and the energies of its inhabitants received any stimulus.

From that time population, wealth, commerce, and the varied industries of civilisation sprang into life and organisation; but we need not recapitulate now the history of this railway, for it is so well known.

In the month of August, of the year 1881, the Marquis of Lorne, then Governor General of Canada, started with a small party from Winnipeg on his memorable drive of over 1,300 miles, through what was then known as the North-West Territory.

The Canadian Pacific Railway at that time was under Government control. The line was slowly being pushed to the westward from Ottawa, and another piece was being built from Port Arthur in the direction of Winnipeg, almost on the same road which Lord Wolseley took in his celebrated Red River Expedition; while a third section had been commenced at Winnipeg and extended about 70 miles into the prairie. The Canadian Government had spent about \$13,000,000 in surveys, the larger portion of which was expended in finding a practicable pass through the mountain ranges to British Columbia.

Beyond a few settlements on the Assiniboia and Saskatchewan Rivers and the various Hudson Bay posts, sparsely scattered throughout the country, there was not a settler's house or an acre of cultivated land to be seen; and we drove mile after mile on the bare barren prairie, doing about 30 miles a day, and encamping out at night. Often it was hard work to collect sufficient fuel for ordinary wants. The difficulties of transport were, no doubt, the principal cause of this barrenness. Then, also, the Indians were not under proper control; and, further, this vast acreage of the North-West had been unfavourably commented upon. It is a somewhat curious fact, illustrating the mixture of ideas which even very intelligent men may sometimes indulge in, that the leader of an expedition sent by the British Government across the Continent some 40 years ago reported the prairie land as being utterly worthless, and then, almost in the next sentence, he added that it was covered with countless herds of buffalo. It never occurred to the writer, nor apparently to the official reader of the report, that land which supported countless herds of buffalo could not be utterly

worthless. The result of this journey of the Marquis of Lorne led to very important results. On his return to Canada he consulted with the members of the Government, and also with some of the leading men in Canada skilled in railway development, and of great business capacity, energy, and clear-headedness.

After sundry negotiations, interviews, &c., the basis of an agreement was determined upon between the Government on the one hand and a syndicate on the other, and out of this agreement sprang the Canadian Pacific Railway. Anyone who has traversed this railway and witnessed the engineering difficulties that have had to be overcome, not only in the mountain sections, but also in the long stretches skirting the shores of Lakes Huron and Superior, must acknowledge that the construction of this railway was pushed forward with extraordinary vigour and success. The Canadian Pacific Railway is a lecture in itself, for think of the varied impressions one must receive when traversing a whole continent like North America! To-night we have only to deal with it from its geographical and civilising aspect, and from the commercial advantages which it has conferred upon this enormous but hitherto unoccupied tract of territory through which it passes. Among other features, it is the only railway in America that has a through line from ocean to ocean, from the Atlantic to the Pacific. Its shares, which at one time were at 35, are now at 91. It still possesses large areas of waste lands, though in some districts these are being rapidly taken up.

Its mineral developments are still in their infancy. Abundance of coal and copper have been found, and are being worked; very important discoveries of both gold, silver, and petroleum have been recently made; and lastly—and this is, I think, very important to the travelling community—it is one of the best managed lines in the world. Comfort and civility are insisted upon by the management, and the officials take great pride in maintaining the credit of the road. Anyone who has travelled in America will appreciate this state of things, as they remember the supreme indifference with which the ordinary railway official of that country treats the passengers under his care.

The railway may be divided into four sections: Eastern, which runs through the older portions of Canada, the provinces of Quebec and Ontario; East Central, which traverses the northern shores of Georgian Bay and Lake Superior to Rat Portage, a country of rocks, lakes, forest, and muskegs—a muskeg is the most troublesome problem railway engineers have to solve in these regions, being the bed of an old, often deep, pond or lake, which has become covered on the surface with a deceptive vegetable growth, and you only realise what deception it practises when you commence to build a railway across it, and begin the process of filling in. In this region silver and copper

have been found, and its mining interests are being developed. It possesses numerous streams, rivers, and lakes, which are full of fish, while its vast extent of pine and spruce woods still produce numerous fur-bearing animals. It must, however, remain a wild country, as it affords no opportunity for agriculture. Its nature is too savage, and its climate too severe. The scenery along the shore of Lake Superior is very beautiful, the train winding past bay and headland, with grey rock, dark green pine and spruce on the one side, while on the other you look down into the turquoise blue depths of the largest freshwater lake of the world. As some of these views may be illustrated by the magic lantern, I pass on to the West Central or prairie portion of the line, which commences soon after leaving Rat Portage and continues for 800 miles to Calgary, at the foot of the Rocky Mountains.

This territory is a vast undulating plain, 700 to 800 miles broad, rising gradually some 2,500 feet as it approaches the mountains. There are two large river systems running from west to east, the North Saskatchewan and South Saskatchewan both having their origin in the Rocky Mountains. Rapids, an ever-changing river bed, and sand-bars are formidable impediments to uninterrupted navigation, consequently they have not been of much use for internal transport.

Transport in former times was chiefly carried on through the medium of the Red River cart, a nondescript sort of vehicle, drawn by a Cayuse or Indian pony, without a particle of iron in its composition, but which, from its very peculiarities, was the only vehicle suitable for the work it had to perform. This plain is almost treeless, not because of want of vigour in its soil, but due mainly to the constant prairie fires, which have burnt down and swept away the forest that at one time covered these plains. It is at times exposed to storms of great violence, and hailstones of enormous size have caused considerable damage. I have known the prairie more than once set on fire by lightning.

Numerous coal measures have been found in this region, thus compensating for the absence of other fuel. These coal seams improve in quality as they approach the mountains; and it is not improbable that, being deposits of a period anterior to that of the generation of the mountains, the enormous pressures to which they must have been subjected, at the birth of the latter, are the cause of this improvement in their quality.

Another peculiarity of this region are the numerous lakes and ponds, called slews, which are dotted all over its surface. Many of these are alkaline, and their waters are unfit for man and beast. In crossing the prairies, therefore, it is necessary both for yourself and your animals to have some knowledge by which the fresh water may be distinguished from the salt.

Professor Macoun formulated a very simple rule to accomplish this end. "All lakes and ponds," he said, "whose waters

were free from any aquatic vegetation, however clear and inviting they may appear, should be avoided; while those whose surface presented rich indications of an active undergrowth of water plants would be found to possess drinkable water." This solution we proved correct during Lord Lorne's tour on these prairies. There are many other points of interest geographically connected with this region, but time will not permit me to dwell upon them in this paper.

We have now to consider the climate of this country, and the agricultural division which results as a natural consequence. The division is briefly in this wise: Two-thirds is productive in wheat and other cereals, and in what is known as mixed farming; the other one-third, commencing about 200 miles from the base of the mountains, is the stock or ranching country. Now this division between grain and stock is mainly due to climatic conditions, for the soil does not vary sufficiently to account for it. You may remember I stated that the prairie rose gradually some 2,500 feet, this rise being naturally more apparent as you approach the mountains. As a consequence summer frosts are more frequent in the more elevated region, and nothing the grain-growing farmer dreads so much; but, on the other hand, the winter near the mountains, in the province of Alberta, is much milder than in the eastern provinces of Manitoba and Assiniaboia, and here we have to look for another cause—a very curious and important one—which thus exercises so much influence on these different agricultural industries.

This cause is the Chinook wind, which modifies in a remarkable degree the severities of winter, and whose action enables horses, cattle, and sheep to find pasture in the open—the nourishing bunch and blue grasses—during the winter months. The cause of these Chinook winds has never been thoroughly ascertained, but the theory of that eminent scientist, Dr. Dawson, of Canada, offers the most probable solution.

They are no doubt connected with the Pacific trade winds, as well as with the knowledge we now possess about what is called the dynamics of meteorology. The following is Dr. Dawson's theory on this very interesting matter:—

"The Pacific trade winds, like those of the Atlantic, are governed by natural laws. They impinge on the western coast of America a warm damp wind, constantly being pushed more and more and more into the interior by pressure on the coast line. The first obstacle that presents itself is the range of the Cascade Mountains, the elevated peaks of which cause a discharge of moisture in the form of snow. This discharge, by the action of dynamic laws, generates a certain amount of heat, and the trade wind advances as a warm dry wind to the Selkirk Range; here, being warm and dry, it drinks up all the moisture it can carry from the summits of the Selkirks. Still advancing

eastward, it finally encounters the range of the Rocky Mountains, when a second discharge of moisture ensues, with the result that it rolls down into the great plain below, the hot dry Chinook wind licking up the surface snow in a most surprising manner, thus enabling stock to feed itself throughout the winter season.

"You rise on a January morning with the thermometer below zero; the white peaks of the Rockies—which in that pure atmosphere seem almost to hang over you as you look at them—glisten in the morning sun. A few fleecy clouds are observed collecting round their summits, and a peculiar blue haze is visible. In three or four hours a warm wind is blowing from the mountains—the thermometer rapidly rises to 40°, 50°, even 60°—the men work in their shirt sleeves, and the snow disappears like magic. Such are the Chinook winds, and to their influence, which extends some 200 miles beyond the mountains, the value of this section of the country for stock-raising is mainly due."

Let us now consider what these two divisions produce, and we will begin by the east, or wheat-growing section, which is largely combined with mixed farming. As regards stock raising in this section, it has to be winter fed, and this of necessity regulates the quantity. The great drawback are the summer frosts which catch the wheat just as it is in the milting stage, a period of about a week to ten days. This is the period when the corn seed is in process of formation, when it is composed of watery particles which, if subjected to 2° of frost, produce wheat of an inferior quality, though it does not affect it being used for seeding purposes. Once past this period, the seed becomes sufficiently hardened, and frosts are no longer detrimental or to be feared. Each year, however, adds to the farmers' experience as to the best choice of site for his wheat field—low lying grounds, which often appear most attractive to the eye, are to be avoided, as damp attracts frost, while slight elevations and ridges are found to be the best situations. Then, also, the time for sowing is an important factor, and the successful farmer of the North-West is he who brings practical thought to bear on these matters, as well as to the ordinary agricultural operations. Last year was an exceptionally good season; and in Manitoba* upwards of 23,000,000 bushels of wheat were raised and harvested—some being lost for want of labour—the whole produce of the North-West being calculated at nearly 36,000,000 bushels.

* The principal crops of Manitoba (The Year Book of the Imperial Institute) in 1890 were:—

	Acres.	Bushels.	Average No. of Bushels per Acre.
Wheat.....	746,058	14,665,769	19·8
Barley	60,035	2,069,415	31·3
Oats	235,534	9,513,433	40·4
Potatoes	10,812	2,540,820	23·5
Total of these crops (excluding other products)	1,052,419	28,789,437	

Fifteen years ago not 36,000 bushels were produced, so we have this enormous increase of a thousand-fold. At Kildonan, on the Red River, wheat has been grown for 35 consecutive years, without rotation, without fertilisation, and *now* produces crops averaging 30 bushels to the acre! If one-half of that comparatively small portion of Central Canada which is drained by the Red River and its affluents were sown with wheat, the product, at an average yield, would be 500 million bushels, or more than the entire amount raised in the United States in 1890. But, besides the Red River Valley, there are the immensely larger Saskatchewan, Athabasca, and Peace River regions, and the extensive wheat areas of Eastern Canada and British Columbia. The Manitoba wheat is considered the finest wheat in the world, as it has taken first prizes wherever it has been exhibited; and though it strikes one unfavourably if placed alongside the fatter and larger seeds grown in this country and elsewhere, it produces the best flour, for it contains less starch and gluten and more nourishing constituents than the wheat of any other part of the globe.

Can we doubt, then, that this North-West, with its 15,000,000 of acres yet unknown, will become one of the great, if not the greatest, granaries of the world.

What has made America the extraordinary nation of 60,000,000 of people in the last 70 years? Not her own increase, but the great tide of emigration which has flowed to her shores; and what has been the great attraction for this emigration? The fertile waste lands she possessed. It has been computed on good data that each emigrant brings to the country of his adoption about £100 per head. Thus, as regards the United States, her lands have been peopled, and wealth has been added to their productiveness. Then railways furnished transport to markets, and by the energy of her people, stimulated by the climate, she rapidly became the great nation she now is. Like causes produce like effects—and from what has happened in the United States, it is not difficult to deduce a fair idea of what this section of Canada will become; and it must be remembered that the fertile waste lands of Canada's great neighbour have all been taken up, and she has no more to offer to the world's surplus population.

Already, besides the Canadian Pacific Railway, branch lines are being constructed to open up the territory, north and south of the main line, between Winnipeg and Calgary. They are built either directly or with the support of the Canadian Pacific Railway, the Government of Canada helping by land grants.

Thus we find Government, capital, energy, and skill all combining to open these fertile lands to the world, which only require labour to develop them.

Last year (1891), while travelling from Winnipeg to Calgary,

I noticed great advancement since I passed through the country five years before. Dotted on the sky line were beehive-shaped corn stacks, while, as the train rolled along, rough homesteads succeeded one after the other—hamlets had become villages, and villages had increased to small towns. The town of Calgary is a notable instance. When I first saw it, in the year 1881, it had three wooden houses—the Government Post of North-west Mounted Police, the Hudson Bay Store, and the Store of I. and D. Baker. Three years after there was a canvas town with a few wooden buildings. Then the railway arrived; the town was moved bodily some two miles nearer the mountains, and canvas disappeared in favour of wood.

Now it has good stone and wooden buildings, a main street, good hotels, a club, is lighted by electricity, is the junction with the Canadian Pacific Railway and the extension to Edmonton on the north, and to the south by the Crows' Nest Pass extension—which runs some 100 miles through the ranche country before striking into the mountains—and considers itself one of the smartest towns in existence, perhaps second only to Chicago, and will probably in a couple of years be wanting an exhibition.

What has accomplished all this? The magic wand of the enchanter was two simple iron rails, laid on the ground a few feet apart, parallel to one another.

Calgary is the capital of the province of Alberta. Alberta was named after H.R.H. the Princess Louise, and is the ranching or stock-raising section of the territory we are now considering. I have before pointed out the useful influence exercised by the climate, as well as the presence of the nutritious grasses so abundantly produced among the foothills of the Rocky Mountains range. It is among these foothills that the ranches are principally situated. The breeds of cattle introduced into the country are the long-horned Mexican from the south, the short-horn and Herefords from England, and the polled Angus from Scotland.

The cattle are quite wild, and range freely in bands over these foothills and adjacent prairies. Each ranche has its own brand or mark, and the cattle are gathered together in bands at the spring and autumn "round ups," when each ranche manager brands the calves which accompany the cows belonging to their respective ranches.

On horseback one can go anywhere, but it is dangerous to venture among these herds of wild cattle on foot, and newly arrived settlers, called out there "Tenderfoots," are warned never to venture near cattle except on horseback. No greater misfortune can happen to a man on the prairie than to be "put down," as it is called—*i.e.*, to get a fall and lose his horse—as he has to tramp home, and is often obliged to make long detours to avoid the grazing cattle.

I am interested in a small ranche formed in the early years of this industry, so give you some actual facts.

We began with 600 head in the year 1882. They were a mixed band, and from ignorance how to handle them and want of experience as regards climate and country, we suffered severe losses in 1884 and 1885. Then experience began to tell. We herded our bulls during certain months of the year; the range was regularly ridden during winter; weakly cattle and cows with calves were gathered and fed through trying storms, with the result that the percentage of our yearly increase steadily augmented. The big grey wolf and the sneaking coyote are serious enemies to the ranchman; and it is a curious fact that after the destruction of the buffalo they disappeared, to reappear again on the introduction of cattle—so much so, that each ranche keeps large greyhounds crossed with staghounds to keep them down. A course after a coyote gives an exciting chase.

We now possess some 1,800 head, and a band of about 40 horses. The principal ranches in the country are the Walrond, the Cochrane, I. and D. Baker, the Oxley, the High River, the Powder River, Garnetts, and the Lister Kaye Company, besides numerous smaller ones. Some breed cattle and horses, while others breed only cattle and horses respectively. The horses raised are chiefly of the heavier kinds, being a cross between Clydesdale, Shire, Cleveland, and Pecheron sires with Canadian mares. This cross produces grand stock suitable for heavy draught, the lighter kind being admirably suited for 'bus or wagon purposes. They are halter-broke when yearlings, a practice continued till they are three years old. This renders them quite tractable, and the open air life, the good water, the pure air, and the nourishing grasses furnish them with abundant bone and muscle, and at three years old they compare very favourably with similar stock raised under more artificial conditions. I saw some of these animals foaled at the Walrond ranche. Last year at the Montreal Exhibition they sold for over \$200 a head, which price leaves a very handsome margin of profit. Cattle are kept till they are three years old, and a three-year-old beef steer will realise about \$40, costing on an average, including losses, about \$20 to raise. The beef of these prairie fed animals is, without exception, the best I ever tasted.

Sheep, though they require more careful tending, give a yearly increase of quite 80 per cent. The wool is good, and the principal breeds are Merino, Oxford Down, and Cheviot. A cross between the Merino and Oxford Down or Cheviot gives an excellent fleece of from 4lb. to 6lb., renders the sheep hardy, and produces a very good carcase of mutton.

The band of sheep belonging to the Lister Kaye ranche numbers over 20,000.

Roughly estimated, there are at present about 50,000 to

60,000 head of cattle, 10,000 to 15,000 head of horses, 40,000 to 50,000 head of sheep, having an aggregate value of, say, 2½ million of dollars. All this has been created within the last eight years.

The markets for this produce are as follows :—

The Indians, who are fed by Government under treaty.

The North-West Police.

The above represent the home market, and consume more than half present increase.

Montreal, Winnipeg, Toronto, and other large cities of Eastern Canada.—These are just commencing.

Great Britain takes live cattle, and a small trade has already commenced, about 4,000 to 5,000 head a year, which will steadily increase.

British Columbia and Vancouver.—A brisk trade has sprung up with the West.

Japan.—The Japanese are desirous to introduce a meat diet into their country. They now live chiefly on rice and fish. It is considered by the Japanese that if the land now taken up by rice cultivation were used for the production of silk and other commodities, more valuable in the European markets, it would be more profitable to the country, and the authorities hope, by substituting meat for rice, to improve the stature and condition of their people. Hence we see new movements and new markets constantly arising.

I heard that a company was about to establish a killing and freezing depot at Calgary, and, should this be the case, the dead meat will be more easy of transport than the live bullock.

The same applies to the ocean transport; hence frozen meat could be sent from Canada at about one-third the cost of live stock in 12 or 14 days. The meat would be in prime condition, as it would have just come off the prairies. Live stock in transport lose about 15 per cent of their weight, and it costs about £5 (this includes everything) per head from Canada to Great Britain.

I wish I could dwell longer on this interesting part of the country, but time and your patience have both to be considered.

Leaving Calgary, in an hour you pass through a somewhat narrow defile, and with a plunge you are in the mountains. I wish I had the word-painting power to convey to you some idea of this wonderful region. It has often been described by many pens far abler than mine, for though I have visited these regions more than once I have still but bewildering impressions left of the scenes I witnessed.

The mind becomes lost, and wanders hopelessly as it strives to recall those mountain peaks and gorges, the eternal snow and mighty glacier, the mountain cataracts and brawling streams, and the deep dark valleys and the snowy summits.

You can form no definite conceptions, draw no inferences, you feel so small, so powerless amid these stupendous works of Nature, where man's littleness becomes so apparent even in his own sight.

In the plains you have just left there is something tangible. There are the farms and their produce, and the cattle among a thousand hills, and you can foresee a future, for you feel God's hand at work in developing it for the good of mankind; but, among these mountains, and with their eternal snows, one feels the silence of God, and that silence fills you with a solemn awe as one seems to hear, far, far away in the avenues of the ages, the Voice which created and commanded the world to be made.

So you journey first up to Stephen at the summit of the Rockies, then down to the Columbia River valley. Here some important discoveries of silver have been made; then for a short distance along the valley, till turning sharply to the left, you enter Rogers' Pass; then upwards and onwards, sometimes clinging to the side of the mountain, then crossing a long trestle bridge, now plunging into a series of snow sheds, and emerging to find yourself hopelessly gazing in the direction of your apparent journey, as there is nothing but walls of mountains in front, on the right hand and on the left. So you wind along, when suddenly you enter another series of snow sheds (this is a region of glacier and avalanche); occasional glimpses of the outer world convey the impression that you are passing up a narrow valley; the train stops as you emerge into daylight, and you have reached the summit station—the highest point of passage in the Selkirk range.

A few miles further on is the Glacier House, and now commences the descent of the "Selkirks." Here occurs what is known by the name of the "loop," of which you will be better able to judge by the photographs at the end of the lecture. From the Selkirks you mount again to the Eagle Pass in the Gold range, thence to the shores of the Shuswap Lakes; then down the south fork of the Thompson River to Kamloops, and so on through the fertile valley of the Thompson River to Lytton, where it joins the Frazer River, then thundering down the deep cañon of the Frazer River, where the scenery becomes very grand, you arrive at Yale, where the cañon opens into a valley, and the train glides along through heavily wooded regions till Vancouver is reached.

Vancouver is the terminus of the railway, and is situated about half-way up Burrard inlet. A magnificent harbour! Beyond Burrard inlet is the island of Vancouver and the Pacific Ocean.

Time, alas! permits us to dwell very briefly on British Columbia. We can only allude to its beautiful climate, cool in

summer and temperate in winter; to its abundant fisheries, both inland and sea; to its magnificent forests of Douglas pine and yellow cedar; to its important coal mines, which produce the finest coal on the Pacific Coast; and to its undeveloped mineral wealth. To indicate to you its national importance, as regards the strategic position it occupies on the Pacific Coast—on an emergency, by the employment of fast steamers for the ocean transport, men and munitions of war could be sent from England to Esquimaux in 17 days.

Vancouver is rapidly becoming a city of importance. Already it has a line of fast ocean steamers to Japan, and another line to Australia is in contemplation. With its natural and commercial advantages it has every prospect of rivalling San Francisco in the influence it will exercise on the Pacific Coast.

But we must now leave British Columbia, and, before concluding my paper, I would, if it will not tire your patience, like most briefly to allude to colonisation and emigration.

When one considers the increase of population in these islands, the depressions and fluctuations of our industries and of agriculture, it appears to me we cannot go on drifting as we are doing much longer. Emigration being a free movement has, up to the present time, provided a means whereby our social and economic conditions could adjust themselves; but the signs of our horizon point to the necessity of further measures, and then we shall have to turn to colonisation. Let me first define emigration and colonisation, as they are frequently confounded, to the detriment of both. An emigrant is one who leaves home with money enough to make a new start in life in the country of his adoption. It is a free movement, with freedom of action, as the mover has the means to carry out his desires.

A colonist, on the other hand, is one who, by sudden disruptions of trade, by circumstances altogether beyond his control, before he has time even to think of emigration, finds himself unable to live in the country, and unable to get out of it. There is nothing before him but starvation, and that leads to Socialism, and the object of colonisation is to place him in a position where, by honest labour, he not only improves his condition, but may become in time a producer, and, as a sequence, a consumer also.

As one pound of fact is worth a ton of theory, I may mention that some eight years ago a number of crofter families were sent out to the North-West to relieve the congested condition of a certain part of Scotland. About the same time twenty families from the East End of London were sent to the same place, and they and the crofters settled down side by side, each receiving the sum of about £120 to £150 to give him a start. As to the crofter he was undoubtedly the best form of settler you could have—enured to hardship, bred to farming, he soon

made his way; and the condition of many of these people, as compared with what they would have been had they remained in Scotland, is most encouraging. The East Londoner, poor fellow!—and nearly all had large families—was about the most unpromising colonist that could be selected; but the experiment was purposely tried with them, as it was argued if *they* succeeded the question of colonisation, as regards the North-West territory of Canada, was practically solved.

I am happy to say many of them have succeeded, and have commenced the repayment of their loans. Some have deserted their lands and taken to their trades, in which they have been successful; but these lands become the property of the society who advanced the money, and their present value covers the advance made to the settler.

No scheme of colonisation should be attempted except on a pure business basis; and there are two essential conditions which must exist to ensure success: (1) Whatever capital is advanced it should have its equivalent in land, or some other form of tangible security; and (2) there must be a market for the produce of your colonies, otherwise their labour is only half utilised.

Now, Canada offers both these conditions, and she has yet millions of acres of waste land only requiring labour to make profitable.

It has been my object to-night to avoid wearying you with statistics, or repetitions of guide and official handbooks. I have rather endeavoured to excite your interest in Canada by giving general information bearing on the science of geography, and by connecting it with the recent development and progress of the country; the mind, in its endeavours to solve some of the larger problems of our humanity, which are continuously arising—problems which concern the welfare and wellbeing of our fellow-creatures at home—turns for a solution to the great dependencies of the United Kingdom, to a federation of Great and Greater Britain, and to a limited empire with Free Trade throughout its borders.

The times have changed, and are changing, when Great Britain was the workshop of the world. Take, for example, the McKinley Tariff, which has recently driven some thousands of tin workers in South Wales out of work; and the same tariff exercises a hostile influence against many of our other industries. I fear that my utterances may not find favour with some of you, but there is no firmer advocate of the true principles of Free Trade in this hall than I am; but when our industries are being crushed, and our artisans are thrown out of work and starving, when the markets of other nations are purposely closed to our manufactures, then, I say, it is good for us to consider the situation.

There are the proverbial three courses : New markets, retaliation, or drift. Let us for a moment consider them :—

New Markets.—By arrangements with our colonies under a scheme of federation, and by the development of our African possessions and other new countries, and so open up new lines of trade for our manufactures.

Retaliation.—Fair trade with those countries who will not have Free Trade with us.

Drift.—Read history ; and if we judge from the stories of the rise and fall of the great nations of the past, we learn that the policy of drift soon led to a state of decline.

It may be urged that geography has little to do with these questions and that I am wandering from my subject, but the condition of the nations on earth is one of its most important and interesting features.

But I have faith in the energy of our people, in the national character which desires—no matter what party guide the helm—that the Government of the country shall maintain the integrity of the Empire, shall be strong against the strong, merciful and kind to the weak, and extend help to those who cannot help themselves.

We have to-night discussed the growth, power, and capacity of our oldest and greatest colony, whose history and development find themselves repeated in the other magnificent colonies of the Empire. We are justly proud of them, for are they not bone of our bone and flesh of our flesh, and may we not look forward to a closer connexion between the Mother Country and these her powerful dependencies, and work for a greater federation than now exists ? And I believe that the influence of such a federation will be a power for the general good of mankind, because, under the blessing of the Almighty, it will maintain peace and goodwill among men.

APPENDIX.

A few figures taken from the Statesman's Year Book, 1893, will be of assistance to enable us to comprehend the vastness of the Canadian Domain :—

POPULATION.

1800	240,000 (estimated)
1825	581,920
1851	1,842,265
1861	3,090,561
1871	3,635,024
1881	4,324,810
1891	4,829,411

AREAS AND POPULATION OF THE PROVINCES IN 1881 AND 1891.

PROVINCES.	Square Miles.	Total Population in 1881.	Total Population in 1891.	Density per Sq. Mile in 1891.	Increase per Cent.	
					1871-81.	1881-91.
Prince Edward Island...	2,000	108,891	109,078	54	15·8	0·17
Nova Scotia.....	20,550	440,572	450,396	22	13·6	2·22
New Brunswick	28,100	321,233	321,263	12	12·4	—
Quebec.....	227,500	1,359,027	1,488,535	7	14·0	9·53
Ontario	219,650	1,923,228	2,114,321	19	18·6	9·93
Manitoba	64,066	65,954	152,506	2·4	247·2	144·95
British Columbia	382,300	49,459	*97,613	0·24	36·4	97·36
Territories and Arctic Islands	2,371,481	56,446	*98,967	0·04	—	75·33
Lakes, Rivers, &c.	140,736	—	—	—	—	—
Total.....	3,456,383	4,324,810	4,832,679	1·45	18·97	11·74

* Subject to revision.

THE POPULATION AND DEATH-RATE OF THE PRINCIPAL CITIES IN 1891.

	Population.	Death-rate per 1,000 in 1890.
Ontario—Toronto... ..	181,220	16·11
Hamilton	48,980	17·70
Ottawa	44,150	21·47
London	31,980	—
Quebec—Montreal	216,650	28·66
Quebec	63,090	33·54
Nova Scotia—Halifax	38,556	28·24
New Brunswick—St. John	39,179	18·91
Manitoba—Winnipeg	25,642	15·71
British Columbia—Victoria	16,841	—
Vancouver	14,000	—

NUMBER OF IMMIGRANTS TO THE UNITED STATES THROUGH CANADA.

	No.
1883	72,274
1884	62,772
1885	25,927
1886	53,429
1887	91,053
1888	85,708
1889	84,862
1890	103,854
1891	105,213

IMMIGRANTS ARRIVING AT QUEBEC.

	Total.	Of whom there were—*		
		English.	Scotch.	Irish.
In 1890	21,165	11,564	2,094	1,170
In 1891	23,435	11,782	1,981	903

AT HALIFAX.

In 1891	10,118	6,203	602	181
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* The rest were foreigners.

A tax of \$50 per head is levied at Vancouver on all Chinamen landing, but there is, notwithstanding the tax, a large increase.

CHURCHES.

There is no State Church in the whole of British North America.

The Church of England has 19 Bishops and about 1,000 clergy.

The Roman Catholic Church has 24 Bishops (including one Cardinal and five Archbishops) and about 1,200 clergy.

The Presbyterian Church has 991 ministers and 2,358 churches and stations.

The Methodists have 1,712 ministers.

The Baptists have about 500 ministers.

The number returned on the 6th April, 1891, of adherents was—

	No. of Adherents.
Roman Catholics	1,990,465
Presbyterians	755,199
Anglicans.....	644,106
Methodists	847,469
Baptists	303,749
Lutherans	63,979
Congregationalists	28,155
Miscellaneous Creeds.....	133,406
No creeds stated.....	33,983
Total.....	4,832,679

EDUCATION.

Total number of public schools	15,522
Total number of superior schools.....	1,039
Number of pupils	1,012,426
Average attendance	530,479
Number of teachers	22,229
Expenditure	\$10,101,908
Percentage of attendance.....	54.66
The highest percentage is in Quebec	75.95
The lowest percentage is in Manitoba	50.00

REVENUE AND EXPENDITURE, CONSOLIDATED FUND.

Year.	Revenue. Dollars	Expenditure. Dollars.
1887	35,754,993	35,657,860
1888	35,908,463	36,718,495
1889	38,782,870	36,917,835
1890	39,879,925	35,994,031
1891	38,579,311	36,343,568

The total debt on June 30th, 1892, was \$290,255,205.

AGRICULTURE.

The estimated wheat crop of Canada was—

	Bushels.
In 1890	40,527,562
In 1891	61,592,822

The export of cheese was 300 per cent more in 1891 than in 1874.

In the North-West Territories there were, in 1891, 129 ranches, with 373,000 head of live stock. In 1881 there were 18,763 head of live stock.

TIMBER.

There was paid duty on timber amounting to \$2,000,000. The production was 1,314,935,103 feet B.M., and 5,561,233 cubic feet of timber, besides boom timber, ties, telegraph poles, cordwood, shingles, &c.

FISHERIES.

The total value of the fisheries was, in

	Dollars.
1887	18,836,105
1888	17,418,510
1889	17,655,256
1890	17,714,902
1891	18,978,078

In 1891 the amount exported was \$9,715,401.

MINES.

	Total Value. Dollars.
1890	19,332,000
1891	20,369,000

The principal mine product is coal.

	Tons Raised.	Value in Dollars.
1890	3,117,661	6,496,110
1891	3,400,479	7,792,175

The coal-bearing area of the North-West Territories exceeds 65,000 square miles.

There were, besides, raised in 1891—

	Dollars.
Gold	1,149,776
Pig-iron	368,901
Petroleum	1,004,546
Bricks	1,047,311
Asbestos	1,000,000
Copper	1,238,780
Silver	407,183
Nickel	2,700,000
Nickel	(exported)

IMPORTS AND EXPORTS, AND IMPORTS ENTERED FOR HOME CONSUMPTION FOR THE DOMINION.

Year.	Total Exports. Dollars.	Total Imports. Dollars.	Imports for Home Consumption. Dollars.
1879	71,491,225	81,964,427	80,341,608
1887	89,515,811	112,892,236	105,639,428
1888	90,203,000	110,894,630	102,847,100
1889	89,189,167	115,224,931	109,673,447
1890	96,749,149	121,858,241	112,765,584
1891	98,417,296	119,967,638	113,345,124

NAVIGATION.

The tonnage of shipping registered on December 31st, 1891, was—Vessels, 7,015 ; tons, 1,005,475 ; of which 1,433 were steamers, with 221,679 tons.

The system of canal, river, and lake navigation is over 2,700 miles in length.

RAILWAYS.

The completed railways of Canada, June, 1891, were 14,633 miles in length.

The main line of the Canadian Pacific Railway, from Montreal to Vancouver, is 2,906 miles in length.

POST-OFFICES.

On June 30, 1891, there were 8,061 Post-offices in the Dominion, with 1,080 Money Order Offices.

Letters sent in year ending June 30, 1891, were 97,975,000 ; postcards, &c., 20,300,000 ; newspapers, books, &c., 25,890,000 ; parcels, 325,960.

Newspapers sent from the office of publication are carried free. The number estimated was 62,000,000.

There were 30,987 miles of telegraph lines in 1891 (2,699 being Government), with 2,657 offices, and there were 4,367,560 messages sent.

UGANDA : ITS VALUE TO BRITISH TRADE.

BY CAPT. F. D. LUGARD.

[Addressed to the Society in the Mayor's Parlour, Manchester, on Monday, November 7, 1892, at 3 o'clock p.m.]

I THANK YOU for the great honour you have done me in inviting me to read a paper before you this evening. At the present moment, however, when so great and so remarkable an interest is being shown throughout the country in the question of the retention of Uganda and British East Africa, my time has been so completely occupied in work connected with this question—in correspondence and in the preparation of papers—that I have not been able to devote that undivided time and attention which I would wish to have spent on the writing of the paper which I have the great honour of reading before you to-day. I am therefore compelled to repeat much of what I have said elsewhere.

At the request of the Administrator of the Imperial British East Africa Company I left Mombasa in December, 1889, to explore the River Sabakhi, and with discretionary power to make a series of small stockades from the coast area to Machako's, the company's furthest outpost, some 300 miles from the coast, should I find the route a feasible one for transport. The Sabakhi is not a navigable river, its course being impeded by rapids some 60 or 70 miles only from the coast; but up to this point it would doubtless be available for the navigation of small craft, though at present it is singular that there are few or no canoes upon it. As a route to the interior, however, it affords an excellent line. There is a supply of water at all seasons of the year—a point of extreme importance in crossing the often arid and parched zone of country lying between the coast and the plateaux of the interior. These latter are mostly well watered. For transport the Sabakhi also offered the advantages of a gradual rise, with few ravines or broken ground to cross; grass for animals in the long, rich glades, which occur at intervals, and abundance of tree-fodder along the whole course of the river for camels.

Its greatest and only drawback lay in the fact that the whole country is uninhabited, and therefore foodless, and traversed only at certain well-known points by raiding parties of Masai on the warpath. This difficulty it was proposed to meet by establishing colonies around the small stockaded positions I formed, and which, for this very purpose, I had located in the fertile glades, which would provide arable land for cultivation and pasture for cattle. These colonies, it was proposed, should consist of Persian or Indian immigrants, and of slaves who had worked out their own redemption under a plan proposed by myself and successfully inaugurated by Mr. Mackenzie. Other duties called me away, or I should have taken great interest in the establishment of these colonies—a task the Imperial British East Africa Company were willing to entrust to me—and in this way testing at once the capabilities of the country and the possibilities of Asiatic immigration for agricultural purposes, and the practical utility of the scheme for the self-emancipation of slaves. These glades, I note, have since been described by the Railway Survey party as areas covered with standing

water in the rains. I am inclined to think this must have been due to an exceptional rainfall, since I passed along this route in the height of the rains myself, and found them entirely free from swamp; nor did I or the natives with me—one being a Persian, who had come with the express purpose of seeing if the country was eligible for agricultural purposes—detect any signs of floodmarks. The basin of the Sabakhi is rocky, and the surrounding country is sterile, with the exception of the glades.

Passing the small lakes and fertile district of Jellore, some 20 miles from its mouth at Melindi—now the location of a mission station—one crosses a barren-looking country covered with sparse scrub, occasionally passing through small patches of fine forest, till the very fertile and populated district of Makongeni is reached, at 40 miles from the coast. It is here that the route I took from Mombasa struck the river; beyond this point cultivation and population entirely cease. You will pass through a very fine piece of primeval forest as you leave the dense villages of the fugitive slaves of Makongeni—forest in which there is a fair amount of the rubber vine—and you will then emerge from the shade of the giant trees into a dense, impenetrable, low forest of cactus, prickly-pear, milk-hedge, and thorny acacia and mimosa bushes. Every bush has a thorn. Every bush that grows a thorn seems to have found its *habitat* here. As you pass onwards, always with the noble river flowing on your right, with magnificent feathery acacia drooping over it—the only fine tree now to be seen, and often 2 feet in the diameter of the bole—the same endless forest of crooked, distorted, prickly bushes proves the barrenness of the soil; and barren it is, for surface granite and quartz take the place of soil. This scrub forest extends away over the Taru plain for a considerable distance. Viewed from any knoll, it presents a dull, uniform grey of endless bush and cactus.

The Taru desert is a wilderness of low thorn jungle, stretching away to the horizon. Great granite rocks appear on the surface, and often (as at Taru) contain huge water-worn cavities 4 or 5 feet deep. These water-holes are a singular phenomenon, seeing that the country shows so few other signs of the action of running water. Through scores of years—perhaps centuries—the stone which had found its lodgment in a hollow in the rock must have ceaselessly revolved round and round, impelled by an eddying whirlpool of water, wearing for itself a larger and a larger cavity, deeper and deeper, with perfectly rounded and smooth sides. And now the rock forms part of the waterless plain. The very stone which wore the strange hole is often to be seen. The cavity, worn by ages of water-action, is now the sole storage for water in a waterless country. Strangest of all, it seemed to me that these water-holes at Taru were not in the bed of a stream, nor even on the low-lying ground, thereby indicating a complete change of configuration as well as climatic conditions.

Following the Sabakhi you will presently debouch on a glade fringed with the camel "jhow" bush and the Nkongi aloe, which forms the whole of the undergrowth of the sterile quartz-land. This Nkongi is a feature of the country. Shaped like a gigantic, solid, triangular bayonet, each spiked blade terminates in a point as sharp as a needle. The wounds it inflicts on the bare-legged natives often turn to large sloughing ulcers. Indeed, I have known a spike penetrate a solid English leather gaiter and go a quarter of an inch into my flesh afterwards. The Nkongi is, therefore, a plant which may be said to thrust itself upon one's attention, especially if it penetrates the flesh. And I believe it to be worthy of attention. The fibre is extremely strong, and not only makes very tough rope, but single fibres are strong enough to use as sewing thread. I found it useful for stringing beads. As we pass upwards beyond the cataracts or rapids, and cross the Tsavo near the site of the third stockade, the acacias which fringe the bank grow larger and finer, and the hyphene palm and borassus become abundant. On the northern bank rises what looks like the edge of

a plateau, terminating abruptly at the valley of the river. This range of hills, or plateau, so far unexplored, is some 700 or 800 feet above the river.

Excepting the Tsavo, there is no watershed to the Sabakhi from the south, a few small, dry watercourses—in which, even in the rains, I have seen no water—being all. During all this time, from Makongeni to near the junction of the Kibwezi, you will have met probably with no living soul, unless you have had the ill-luck to fall in with a Masai band on the war-path, or a small party of Wakamba passing hastily with bows strung, escorting a batch of cattle to the coast for trade, and eager to avoid the dreaded Masai. Possibly, however, as you suddenly rounded an angle in the winding game path, you may have been completely taken aback to find yourself face to face with a Galla, accompanied by only two or three friends, each with a spear 7 feet long. You ask him whence he comes and whither he goes, and he replies with absolute nonchalance, and as though he had been expecting you all day, and knew you were on the other side of that opaque bush before you rounded it, that he is “walking” for pleasure. On inquiry you find that this walk probably began a month or two ago, will continue a month or more yet, that he covers from 20 to 30 miles a day, has no object in his walk except the Galla love of roaming, and no wardrobe or belongings of any sort or kind except his 7-foot spear—a strange, nomadic race, once a powerful one, now squeezed and elbowed by their two most powerful neighbours—the Somals in the north, the Masai in the south—both of whom they dread with a constant fear: a wonderfully handsome race, with high foreheads, brown skins, and soft, wavy hair, quite different from the wool of the Bantu races.

The country beyond Taita is little better than that to the east of it. Doubtless, irrigation channels could be successfully led from the upper reaches of the Tsavo, and then this country might become a garden of cultivation; but, as it is, villages are few and very far between, and the country is given over to wild thorn-growth and aloes, and is the *habitat* of the rhinoceros and antelope only. From Taru to Maungu an excellent road has been cut through the bush by Mr. Hobley, at the company's initiative; and now, shortly after crossing the Tsavo, we strike the most excellent road in course of construction by Mr. Wilson, of the East African Scottish Mission, under the auspices of Sir W. Mackinnon. I look on this road as a triumph, because it has been made almost solely by the labour of the local tribe—the Wakamba—the first and only successful attempt to induce this tribe to undertake free labour.

Just short of the junction of the Kibwezi we leave the Sabakhi—or Athi, as it is here called—and strike across to the old trade route, *via* Taita, where it crosses the Kibwezi at Kikambuli. Here we are in the country of the Wakamba, whose country, Ukamba, extends from here to the borders of Kikuyu and Masai. From here we begin to ascend the inner plateau of Africa, till we reach Machako's, at 5,000 feet. So many travellers have now passed along this route that I must leave it to some other pen to describe the country and its people, tempted though I am to linger with them for a moment.

While still my task of opening up the Sabakhi, and building six stockades between the coast and Machako's, was hardly complete, I was recalled to organise an expedition for the occupation of Uganda. Fresh instructions, however, directed me not to proceed thither, and I left the coast for the second time on August 6th, 1890, to open up the little-known country of Kikuyu, beyond Ukamba, and build the station and stockade of Dagoreti. My task was already nearly accomplished when, on October 19th, I received orders to proceed to Uganda. After completing my work in Kikuyu, selecting the goods for barter, and laying in the necessary food to cross the 250 miles of foodless country in front of me, I left Dagoreti on November 1st, and

arrived in Uganda on December 13th, passing through Masai-land and Kavirondo, and adopting the well-known route, *via* Baringo, and across the mountain ranges of Elgeyo and Kamasia.

As this first route is already well known from the descriptions of Mr. Joseph Thomson, Messrs. Jackson and Gedge, and others who have passed by it since myself, I will not attempt any description of it, but will confine myself to a few remarks on the more southern and more direct route along which I returned, which in all probability the railway would take if constructed. Passing round the north of the small lake of Nakuru, we leave the Masai behind us, and traverse a gradually-rising plain. There is no escarpment, and no difficult gradient. Passing the sources of the Lilwa, and crossing two small rivers, easily fordable except in the rains, we find we have already attained a considerable elevation. We enter a long valley with lofty hills on either side, and, still ascending, emerge eventually on the undulating grasslands of the Mau plateau. With the exception of perhaps two stretches of some fifteen miles each, where there is little or no firewood, these plateaus are well wooded and well watered. Considerable patches of forest afford timber, which would answer for local building purposes and fuel. Magnificent trees of a species of juniper rise without a branch, straight as a ship's mast, for 50 feet, and attain a diameter of 5 feet. The timber is brittle, like cedar. Bamboos, that most useful of all material for rough building purposes, are found in these forests, and excellent running streams water the country in every direction.

Gradual and easy as was the ascent to these altitudes, the descent to the Kavirondo plain is hardly more difficult, over the northern slopes of the Nandi Hills, or round by the valley of the Nzoia. But of gradients and levels, of alternative railway routes, of bridges and comparative physical difficulties, I must leave the Railway Survey to speak.

Descending from the lofty plateau to the Kavirondo plain, at an elevation of nearly 4,000 feet, we are again in the midst of a dense population. There is no more friendly tribe in Africa than these simple Wa-Kavirondo. They are a purely savage tribe, repudiating all kind of dress. Very large quantities of grain are grown here, more perhaps than in any other locality passed through on the way from the coast; and the passing caravan can obtain several thousand pounds which the people are willing to sell for beads, and which are surplus to their own wants. Their villages are surrounded with a high mud wall, and a very deep trench from which the mud for its construction has been taken. The men are armed with a long and inoffensive-looking spear, but generally go about entirely unarmed, a characteristic which I have never seen in any other tribe in Africa, and which proves them to be an essentially peaceable and unwarlike people. Formerly, they owned large herds of cattle, but these all died of the horrible plague which has recently swept across Africa, and carried off all the cattle, the wild buffalo, and much of the other game from the coast to the shores of the Albert Lake, and I know not how far to north and south, and that it may still be spreading. They live in constant fear of their powerful and warlike neighbours, the Wa-Nandi, and even the Masai, who, though separated from them by the Mau plateau, which I have described to you—in a stretch of over fifteen miles of uninhabited and foodless country—yet frequently made raids, both on Kavirondo and on the yet more peaceable and defenceless people of Kitosh. I fear also that the slave-buying, slave-stealing trader from the coast, is working his way into these countries, buying human lives for guns and powder, and thus working a two-fold destruction; and I earnestly hope that England will not draw back from this country and leave it a prey to these people. It is a picture from which you turn in disgust, but, to my mind, bad as is the practice of buying human flesh, there is a worse side to the

picture still. If unfettered by the presence of Europeans, these slave-buyers acquire a great influence with the natives; their thin veneer of civilisation, their coast ways, their coast wares, their knowledge of fire-arms, and their superiority in cunning and address soon constitute them the ideal of the naked savage. They gain an influence, and their influence is all for bad—they teach the people that to sell their fellow-men is right and good. There is not so much of this vile influence at work in British East Africa, though I have seen it most fully developed in Nyassa land. If the British nation faces its responsibilities now as it has ever faced them in the past, and a British influence under the British Government be proclaimed in East Africa, the fear of the slaver's influence will be for ever past.

Leaving Kavirondo, we pass westwards to Usoga. No natural boundary divides the two countries, unless it be an insignificant stream, but a more complete change, both in the physical aspect of the country and in the people that inhabit it, it is impossible to conceive. From the open plains and grain-fields of Kavirondo you pass at a single step into a country of dense, endless banana groves; potatoes and casava take the place of millet and maize. From savages devoid of any clothing whatever you find yourself among a people clothed, man and woman alike, in the beautiful soft mbugu, made from the barks of various figs.

The country is rich in flocks, and formerly owned great herds of cattle. Produce of all kinds is in great abundance, so that Usoga earned the title of the cook-pot of Uganda. There is no king of Usoga; the country, though small, is ruled by near a score of independent chiefs each of whom, I believe, owes some sort of allegiance to some Uganda chief. The people are of an independent character; they detest the Waganda intensely, and are ever ready to try and shake off their yoke. Thus in the recent troubles in Uganda the Wasoga rose *en masse*. The chiefs are most cordial to Europeans, and welcome them, and are eager for their friendship, as in Uganda; but throughout all Kitara I believe the peasantry to be averse to all European interference, for they are blindly loyal to their kings and chiefs, and fear that the white men may undermine their power and prestige.

Uganda offers many marked characteristics, both in its geography and in its people. It is a country of low hills and valleys; throughout the majority of the country it would be hard to find an acre of level ground. The hills are of red marl, or marl-gravel, and shale, generally covered with pasture grass of a kind which, I think, is peculiar to these countries, and though a spear-grass, is apparently nutritious and good grazing. The valleys are generally of rich black soil, and most frequently the lowest part of the dip is a river swamp. These river swamps merit a word of description. Throughout Unyoro and Uganda almost every valley and dip contains this curious and wholly disagreeable phenomenon. The swamp varies from a few score of yards to a mile or more in breadth, usually being from half to three-quarters of a mile. There is a slight trickling current—but very slight; the river is choked with dense papyrus, with an undergrowth of marsh ferns, grass, reeds, &c. The water is usually the colour of coffee, and red with iron rust. Most of these swamps, are of treacherous quagmire without bottom; and unless the roots of the papyrus form a sufficient foothold, it is necessary to cut down reeds and boughs of trees to effect a crossing. The constant wading through these swamps, often reaching nearly to the waist in black and sometimes fetid mud, is the chiefest disagreeable of travel in these countries, for they occur frequently at intervals of a mile or less, and can only be crossed at known spots, where the papyrus has been cut down and crossings prepared.

I was, therefore, fortunate in finding a line of road from the Victoria Lake across Buddu, Northern Ankole, to the lower slopes of Ruwenzori, and thence to the

Albert, which is almost entirely free from these swamps, and would offer few difficulties as a transport route. It has the great incidental advantage of touching the great Albert Edward Lake and the Salt Lake, and so of tapping the produce of the districts which border the shores of both, and the produce which accumulates at the latter, in exchange for salt.

I have pointed out that the watershed of Uganda and Usoga is towards the north, and not towards the lake westwards of the Nzoia. This of course produces the curious phenomenon that in passing westwards you will cross the Nzoia flowing south, and almost immediately afterwards, having passed over no noticeable change of contour, the stream is found flowing in the contrary direction. The same general configuration is noticeable with regard to the Albert Lake. One naturally expects that to maintain these vast inland seas all the watershed of the country would be absorbed by them; and even so it would be a cause of wonder how the evaporation was compensated over an area of water close to the Equator at an altitude of only 2,000 feet, and the Nile, now a vast river, flowing northwards through 1,000 miles of equatorial heat, without a single tributary to supply the waste till it reaches close to Khartum. Yet here again you shall stand on Kavalli plateau and find every stream and rivulet running westwards to the Ituri, and thus through the Aruwimi and the Congo to the western coast. Further north the Welle and Oubangi, and other giant tributaries of the Congo, carry off the drainage of the country away from the Albert and away from the Nile.

The close of the year 1891 and the early part of 1892 were exceptional in the matter of rainfall. Usually in this part of Africa the lesser rains begin early in October and cease in the middle of December. From that time the heat and drought increase, and the grass dries up and is burnt, till in the beginning of March the greater rains set in, and a tropical downpour continues with few breaks till the end of May. Last October and November the lesser rains were unusually heavy, and continued with little intermission till the time of the regular rains in March. There was a little check, and then the rains continued up to the time I left Uganda, in the middle of June. Still, they did not cease, and we found the rivers, which should have been running down, all abnormally high. We did not leave this zone of rain, or the rains did not cease, I know not which, till we descended from the Mau plateau, and found there had been much drought in Masai-land and Kikuyu. The result was that the Lake Victoria was some 6 feet, perhaps, above its ordinary level, and may probably rise still higher. I looked forward with interest to hear if this should have caused any appreciable change in the height of the Nile in Egypt. I found that unusual floods had occurred in September, this not being the time at which the usual high Nile, due principally to the floods poured down by the Atbara from Abyssinia, occurs; and apparently the water took about the same time to reach Egypt, travelling about 2,000 miles, as it took me to reach the East Coast, which I did on September 1st. This incident is not without its significance. Had I, in Uganda, been able to telegraph or heliograph the news of the abnormal rainfall, and the rise of the Victoria Lake, possibly steps might have been taken to prepare for the floods, and much of the damage caused might have been prevented. Egyptian administrators may perhaps find herein a new argument for the retention of Uganda!

When going out to attack the Mahommedans in April, 1891, on the frontiers of Unyoro, and again in May, 1892, when I went to conduct the negotiations with them which eventually led to their repatriation, I had an opportunity of traversing a very considerable portion of Western Uganda, and so of verifying the general conclusions I had come to as regards the characteristics of the country which I have just indicated. It is, I think, a decidedly fertile country, capable of growing anything; but

the population live almost entirely on bananas and roots, sweet potatoes of various kinds, and casava. The banana is grown to great perfection, and the best varieties are extremely luscious, surpassing any I have seen in other countries. It is also cooked when green in a hundred ways, dried in the sun and pounded into flour, fermented and made into pombé or cider. Wheat and rice have been successfully grown, and tobacco from imported seed, and all of good quality; but I think more lucrative results may be hoped for in the cultivation of the vine for wine-making, and of coffee, unless the much-talked-of railway should be constructed.

The Waganda are a singularly intelligent people, excessively eager for knowledge of all kinds, whether it be of reading and writing, of religion, or of useful artisan trades. Those few who have had an opportunity of learning any trade have become most superior workmen. They will construct you a new stock to a rifle which you will hardly detect from that made by a London gunmaker. The Fundi Kisule, who learnt his art from Mackay, is an accomplished blacksmith and gunsmith, and will make a new spring or repair any damaged rifle with admirable workmanship; and their folding-stools of rod-iron, and their beautifully-turned-out spears, attest their ability as blacksmiths. When first I heard of the proposal to establish a Scottish Industrial Mission in East Africa, I eagerly advocated—in reply to a communication asking for my ideas on the subject, which I had the honour to receive—its location in Uganda. Boat-building, carpentry, and, indeed, any other artisan work, would be eagerly sought by them, I am confident; and the difficulty would be to limit, not to obtain, the necessary number of pupils. Their indigenous arts bear evidence both of their delicate handling and of their skill. I regret that I have not here specimens of the numerous articles made in the country to prove my point, but the few small things I have brought with me will, I think, indicate their natural talent. The Waganda are a warlike people, and ever ready to go to battle. There are, I estimate, some 6,000 guns at least in the country, the majority of which are muzzle-loaders, but with a considerable proportion of improved breech-loading firearms. They make plucky soldiers, but are difficult to teach the routine of discipline. I could give you many stories illustrative of their pluck which have come under my own observation, but one will suffice.

When we met in Unyoro the hostile army of Kabarega, enormously our superior in numbers, I told a Muganda chief, who had come with me as a volunteer, with some 30 followers, to clear the enemy out of a piece of dense acacia bush. It was a nasty task, for he was very greatly outnumbered, and they would probably hold their own in the thick jungle even if we beat them in the open. A few days before we had had a small brush with the Wanyoro, and the Waganda had fired a good many rounds of ammunition, at which I was somewhat cross, for I had very, very little. We parted, and I did not see the man again till after we had captured the Wanyoro camp. I congratulated him on having swept the acacia bush, and asked if his ammunition had held out. He replied with some pride, and to my extreme surprise, that he had not fired a single round! His determined charge had driven the enemy back; and though the Waganda are excessively excitable, he had pursued them and cleared them out never replying to their fire, and determined not to waste a cartridge unless absolutely in defence of life! I think it was as plucky a thing as I have ever seen.

The Waganda are, moreover, an excessively litigious, argumentative people, and this, combined with their excitability and their pluck, renders them an obviously difficult people to govern, the more so that they are excessively distrustful and very untruthful. The intricacies of their system of land tenure, and the complicated division of sub-chieftainships, almost defy solution to any but a born Muganda, and are the source of endless quarrels and litigation. They have the keenest possible

appreciation of justice and fair play, but the grounds on which they base their decisions are frequently so utterly foreign to our conceptions that one never knows by what standard of discrimination any particular case is to be decided. Decisions which to a European seem harsh, or altogether beside the question, are accepted with acclamation as the most impartial justice; while what would recommend itself as fair to a European may not unfrequently, should it militate against some old-established usage, be received in astonished silence. Pending a really thorough and complete knowledge of all the points involved in these land questions, I endeavoured always to find a solution acceptable to both parties, reserving my own more direct jurisdiction for criminal cases where the facts were patent.

I told a Muganda chief—a special favourite of mine—that the money spent on my expedition, and on the administration of Uganda, had amounted to a very large sum, and that the country so far had produced but little to recoup those who had given this money. I said I feared that they might grow tired, and say this country is full of difficulties and of troubles only. He went away much depressed, and some time after wrote me a long letter. He said he had thought continually over what I said, and how he individually could possibly help; and the only way he could do so was by going and shooting elephants and giving the ivory to the company, to show his gratitude for all that had been done for his country. And he would go himself and lead his men, and expose his life, on purpose that they might follow his example and be successful hunters. Now, when it is remembered that with ivory the chiefs buy cloth and all that is dear to their hearts—that it is absolutely the gold coinage of the country—who shall say that this offer does not show a really fine and generous trait of character—and gratitude? This same chief was the only one in Uganda who told me he was glad I was going, “for,” he said, “you need the change to your own country. You have worked hard for many years, but my heart cries at your going.”

In June, 1891, I left Uganda with the object of coming in touch with the Sudanese refugees from the Equatorial Province, who had assembled at Kavalli's, on the south-west shore of the Albert Lake. Marching from near Masaka, the capital of Buddu, I traversed Northern Ankole—a district hitherto unvisited by any European, though Mr. Stanley, in 1876, had travelled parallel to it within the boundaries of Uganda—and reaching the borders of Kitagwenda, proceeded south-west to the narrow channel or river which connects the upper lake of Rusango with the main waters of the Albert Edward Lake. Crossing this narrow channel (at most 500 yards across), I camped in the hostile country of the Wasura—a tribe subject to Kabarega, of Unyoro, and identified with the Wanyora. Here I came upon Mr. Stanley's route at the Salt Lake; but since at this time I had seen neither his book nor maps, my journey, so far as I was concerned, was in the nature of entirely new exploration, though, of course, I had been anticipated in the discovery of the Albert Edward Lake and of Ruwenzori. The natives, too, being hostile, I met with no one who had seen Mr. Stanley, or could inform me of his route, or tell me of his exploits.

Buddu abounds in the river swamps which I have described; but the route from Bujaju, on the lake, across to Marongo is very free of them. The western portion of Buddu, bordering on Ankole, is not thickly populated, being somewhat poorly watered; but it affords large areas for grazing, in which are found considerable quantities of game. Buddu is some 50 miles across from Victoria to the borders of Ankole. The small kingdom of Koki does not extend northwards to the Katonga co-terminous with the whole western boundary of Buddu, as has hitherto been shown on the maps. It is a very small state, lying to the south-west of Buddu, under a tributary king—Kamswaga—who pays his dues to Uganda through the Pokino chief

of Buddu, as does Bwera, on the north-west, at the angle of the Katonga and Kyojia rivers. The people of Koki are of Bantu origin, and are agricultural. Koki is bounded on the west by the Lake Kichera. Northern Ankole is not thickly populated. The king of the country and the ruling race are the Wahuma; but considerable numbers of Bantu tribes—offshoots from the Waganda, Wanyoro, and especially the Wa-Koki—are settled throughout the country. Before the cattle all died of the plague the Bahuma were a purely pastoral people, like the Masai, and such cultivation as existed in the country was entirely undertaken by the Bantu races, for the Bahuma are a hospitable people, unlike the Masai, and freely permit strangers to settle in their land. Thus, they gave shelter to the Christians for a year when they were driven out by the Mohammedans from Uganda, and also to numbers of the people of Toru. These latter were Wahuma under a Muhuma king—Nyiku—who was ousted by Kabarega. Now, in their distress and starvation the Wahuma are largely dependent on these Bantu settlers for sustenance, though they are learning gradually to cultivate for themselves. Very large numbers died with their cattle, and the residue, unused to a vegetable diet, which thoroughly disagrees with them, are a gaunt, ill-fed race, generally subject to skin disease. They are a fine-looking people, with handsome faces, bony and often aquiline noses, clear-cut features, and thin lips. Their racial affinity is probably with the Somals, and, possibly, the Gallas. Being exclusively nomadic, the villages are small, and the cultivation scanty. The country is an open, undulating land of low hills and long valleys. Acacia is the common tree, and is very abundant. Pasture and fodder abound. On my route to the Albert Lake I passed many deep and almost symmetrically-circular depressions, like the crater of a volcano or a dried-up pond. A few of these, as shown on the map, were tiny lakes no bigger than a millpond, but apparently of great depth, with clear, blue water and all the characteristics of a lake. The alligator and great fish eagle haunted their waters. Others, again, were dry, the bottoms being perhaps 100 feet or more below the level of the surrounding country, which is about 4,200 feet.

The composition of the hills is, as in Western Uganda, a red marl, while the valleys are of excellent soil. The origin of these crater-basins and small lakes is hard to account for, as the country offers no indications of volcanic action.

This route from the Victoria to the Albert Edward affords a good route for transport, and would, I think, offer few engineering difficulties for a railway. Reaching the borders of Kitagwenda, there are two alternative routes—the one skirting Kitagwenda enters at once into a hilly and very difficult country; the other crosses two or more river swamps before the lake is reached. In our up-journey we followed the route which, ascending the Chigamagera Hills by a steep climb to an elevation of some 5,000 feet, crosses a well-watered and rich tableland, and descends again to the valley of the Kitumi—the stream which forms the boundary of Kitagwenda. Thence, winding among lofty hills, often among narrow and precipitous paths, descending into deep gorges and reascending, we cross at right angles the watershed from Ankole to the Albert Edward Lake, passing through the country of Kaihura—a vassal to Ntali of Ankole. At last we reach the edge of the escarpment, and descend to the great lacustrine plain of the Albert Edward. Already we have viewed several small new lakes, the Ruamiga being especially lovely in its scenery and surroundings, stretching its arms away among the overhanging rocks of the surrounding hills—a picture of solitude, with no dwellers around it. Two more small lakes, some 3 miles each in length, are dotted on the plain. This plain is 13 miles across from the hills to the lake, and is on a dead level. It is treeless except for a low acacia scrub as we near the lake and reach the villages of Kakule. These are a colony of fishermen, who live almost solely on the fish they catch, the salt they steal from the Salt Lake and

exchange for produce, and the hippo they spear with harpoons headed with blocks of ambatch wood, as light as cork. Their canoes are unlike any I have seen in Africa, being made of thin boards sewn together, and the whole canoe is as pliable and yields as easily as basketwork.

Having ousted the Wasura, who are aliens in the country, and have treated most cruelly the aboriginal Wa-Usongola, I built a fort on the narrow tongue of land which divides the Salt Lake from the Albert Edward. The country here is barren to a degree and bare of vegetation, but for a few stunted euphorbia and cactus. Remains of ancient villages were visible; but owing to the cruelties of the Wasura, who, under a chief of Kabarega's, named Dukala, held the Salt Lake for that tyrant, these had long been deserted, and the country depopulated. It is, however, extremely healthy, and the water of the lake is excellent. It is a wonderfully beautiful lake at this spot. The shores run clean down to the rippling water, with little or no marginal swamp and reed beds to hide its outline and detract from its beauty. Green islands covered with trees are studded about the foreground, and the deeply-indented bays add a picturesque variety. On the other side, as you stand in Fort George,* is the deep crater-like cavity at the bottom of which lies the Salt Lake, whose water is of a deep claret-red. It is very shallow, and every stick and stone, and the banks on its margin, are encrusted with the crystal salt, exactly as you shall see a pond in England when a slight frost has fringed its edges with ice. The salt is excellent, white, with a beautiful rose tint, and the natives come from great distances to barter food and produce for it.

Although the giant Ruwenzori lies behind it at no great distance, a perpetual haze obscures it, and even the closer peaks of Rusesse are very rarely visible. While my fort was in course of completion I made a rapid ten days' trip across the Semliki to the camp of the Manyema slave-raiders at Miala, who had been represented to me as being the Soudanese of whom I was in search. These men are the furthest southern detachment of Kilonga-Longa of Ipoto. They have ravaged the district round them, and are held in great dread by the swarming and helpless population among whom they have settled. They level blackmail in ivory from the more distant posts to which they travel, but claim a monopoly of all within their reach around them. From time to time they invent a grievance and a quarrel, and fall upon some helpless tribe, and massacre large numbers of them and carry off the slaves they require. They treated me civilly, and, indeed, are not bad fellows—plucky and loyal, had they only been trained in a better school. But the slave-raiding Arab was their beau-ideal, and they saw no wrong or shame in their trade. I have, indeed, found that, of all the various African tribes included in the broad term Zanzibari, none were braver, none more trustworthy or more loyal, than the Manyema. They are a splendid material, but, alas! are being perverted to the basest uses by that scum of all humanity, the so-called "Arab" slave-raider—so-called, I say, for you shall find very many pure-bred Arabs most gentlemanly fellows. Your slave-raider is more usually a mongrel—the son of some poor slave girl by the fortieth cousin of a half-caste Arab. They sent to me, as they heard of my approach, a tiny girl-child as a present. It transpired she was a dwarf from the forests. Others they had caged like wild beasts, and they told me—which I can scarcely believe—that Emin Pasha, on his way past here, had commissioned them to catch them for him against his return.

I took the child, and with her a boy dwarf as a companion. They became the pets of the expedition, accompanied us eventually to Kampala, and two merrier,

* Named after Mr. George S. Mackenzie and Mr. George Wilson.

happier little folk I never saw. They are there still. Sedjamkuru, the boy, in a rig-out of scarlet calico, acts as drummer-boy to the Zanzibari contingent on state occasions, and both are free to play about to their hearts' content. Like all young savages, the cookhouse is their headquarters.

Miala was some distance in the Congo Free State, and beyond the British sphere of influence. I therefore marched due east, recrossed the Semliki, visited Emin's camp at the foot of Ruwenzori, and crossing the spur of hills which runs down from the great mountain towards the lake at a point higher up than I had done before, I returned to my fort at the Salt Lake. The Semliki, where it issues from the Lake Albert Edward, is an insignificant river, and conveys no great body of water from that lake to the Albert. As it winds, however, along the western base of Ruwenzori, hundreds of streams pour the snow-water from the perpetual snows on Ruwenzori into its basin; and when it again emerges into the long valley which bears its name (once, doubtless, part of the Albert Lake) it is a broad, deep, and rapid river, bearing in drought or in monsoon alike a great body of water towards the Nile. In parts it affords some lovely scenes—cascades and falls in deep gorges, overhung with magnificent trees. Huge herds of elephants wander along its banks.

I have said that the Lake Albert Edward consists of two portions—the Mwutan-zigé (Barrier to Locusts), viz., the Great Lake, and the Rusango. This latter is in reality a separate lake, connected with Mwutan-zigé by a river, at most 500 yards across. Its general direction is north-west and south-east. There is no swamp around it except at the north-west end, where dense jungle and impenetrable marsh afford a home for great herds of elephants. It is at this point that the rivers Wami and Mpanga, into which the countless streams to the south of them from Ruwenzori flow, bring their waters to the lake. The gorge through which the latter flows is picturesque in the extreme, especially in the rains. The great body of water confined between its rock walls boils and eddies over the sunken rocks below. The gorge is some 700 feet deep, and is full of the tropical forest—the orchids, and the ferns, and the mosses, which are found in such a place where the damp vapours hang, and form a natural forcing-house.

Leaving at Fort George a small garrison, I marched along the north-eastern arm of the lake, with the mountain pile of Ruwenzori increasing rapidly in height on my left. Where a long bay of the lake runs out towards the mountains I found Kabarega's forces drawn up to oppose me. We turned them out, and camped in their enormous camps, and so onwards, where the Mupuku—a large and almost impassable stream—comes out of a long gorge among the mountains. Here, with the Sebwe behind me, at the very foot of the loftiest snow peak of Ruwenzori, I built the Fort Edward,* and established the son of the old King Nyika, whom Kabarega had ousted from his country of Toru; and the fugitive Wahuma came out from their hiding among the mountains, escaped from their slavery among the Wanyoro, or bade farewell to Ntali, who had sheltered them, and with great rejoicing recognised the boy Kasagama as their king.

Leaving Mr. Stanley's route, I followed the eastern base of the Ruwenzori Mountain, crossing the endless streams which descend from its perpetual snows, and bear their clear, sparkling, icy-cold water to the Wami and Mpanga, and so to the Albert Edward. And here it is curious to note that the watershed of the eastern Ruwenzori is not towards the Albert, and so to the Nile, but to the southern lake, from which the only overflow is the Semliki—a river which at its exit probably conveys a lesser volume of water from the lake than is contributed to it by the Mpanga

* Named after General Sir Edward Lugard, G.C.B.

alone. The country is wild, with dense elephant-grass 10 feet high and scrub bush obscuring the view, except where, as at Buhudi and Butanuka, we emerge on the densely populated and cultivated areas. The ground rises gradually from the level of the Albert Edward, 3,800 feet to some 5,300 feet at Kiaya. Here we descend into the head of a narrow valley, while the plateau we have been traversing trends away to our right, and forms the uplands of Unyoro, its bold outline appearing from the Semliki Valley and the Albert Lake like a lofty range of hills. The valley of Kiaya is extremely fertile, intersected with streams, and studded with banana groves and cultivation. I found here a small Waganda colony, who had left their country in the troublous times of war. The valley opens out as we pass along it, and winds among the hills, the giant mass of Ruwenzori still towering on our left. Between the edge of the plateau we descended, and the base of the Ruwenzori there is a deep trough or gorge, the hills rising steep, as it were, from their own foundations, and disdaining connection with the plateau, which reaches to their very feet. Leaving Kiaya, we pass through a wild country of quartz and scrub jungle, bisected at right-angles by gigantic ravines of rich soil, in which are villages, forest, and cultivation; and so we reach the edge of this lower plateau, and look down on the Semliki Valley below us. Simultaneously the massive peaks of Ruwenzori slope down to lesser hills, and mingle with the plain. Opposite us appears a new range of mountains, increasing in height from south to north. Mountains they are, but, like those we leave behind us, they are more rightly the escarpment of the plateaus on which the sources of the Ituri, and the other great affluents of the Congo, take their rise, which, for convenience, we will call the Kavalli Plateau. Crossing the plain and the Semliki—now a noble stream, passable only by canoes, which we found great difficulty in securing, being attacked once more by Kabarega's hostile rifles—we waded all day till nightfall through a pestilential swamp of dense reeds and giant grass, through which we pioneers forced our way with infinite toil, throwing ourselves bodily on the mass of vegetation, and forcing it down till we formed a way over it, waist deep in water. As one after another was completely exhausted with the violence of the physical exertion, a new hand would take his place. The swamp wasps also occasionally attacked us, and I was right glad to gain dry ground before the sun set and darkness fell. Such incidents sometimes occur in African travel.

Marching along the base of the Kavalli Hills, through a country little traversed by man, and following the paths made by elephant and hippo—through very dense high grass and patches of forest composed of the lovely flowering mterooanda, and many gorgeous flowering trees—we met no inhabitants till we came upon a small village of friendly hunters, in the depths of a magnificent forest. Guided by them we ascended the hills, and ere long found ourselves at the headquarters of the Soudanese whom I had come to find. After some difficult negotiations with their leader, Selim Bey—the pith of which was to settle who was to be master, he or I—they agreed to be ready to follow me in some sixteen days. These people have no idea of hurry, but, anxious about Uganda, I would allow no delay, and within the stipulated time they were ready to follow me. The Kavalli Plateau was the site of Mr. Stanley's protracted camp, and has been fully described by him. Undulating hills, with sparse villages dotted here and there; parts afford good pasture; parts are covered with the 10-foot elephant-grass. Doubtless the loss of the cattle, and the immigration of these hordes of ruthless Soudanese, had denuded the country both of its inhabitants and its food. When I was there there was little of either. The plains along the valley of the Albert Lake are also thinly populated. A few small detached villages, whose inhabitants lived by fishing, and by washing a saline earth and preparing salt, which they sold to the people of the hills for food, were all that were to

be met with. These wretched people groan under the tyranny of the despot of Unyoro. They dare neither own cattle or flocks, or even to crop, or store food, for all would be taken from them by Kabarega. Indeed, they hardly dare call their lives their own. Periodical raids by the Wanyoro drive them for shelter to the depths of the forests or the recesses of the mountains. Those who are not fortunate enough to fly in time, or are unable, by reason of age or sickness, are massacred or enslaved. Such is Kabarega's rule. They welcomed me, and begged me to live among them. I replied that I was about to place a barrier between them and their tyrant, and they should live in peace. Great areas of excellent pasture land extend along the shores of the Albert Lake to where the hills impinge upon the lake to the north. An excellent harbour is formed near the long promontory of Nyamsassie. Southwards of this the country becomes arid and sterile, covered with sparse jungle scrub, till it merges in the great swamp around the mouth of the Semliki. On October 5th I left Kavalli's with the vast following of the Soudanese, their wives and their children, their slaves and their followers. Sending an advance party by water, who rounded the mouth of the river in two canoes lent me by the friendly chief—my blood-brother Katonzi—they gained the further bank, to find that Kabarega, in order to prevent my return, had destroyed every canoe on the river. Katonzi's willing followers ferried us across—the work of many days—and one by one each individual of the refugees was counted as they landed—men, women, and children, 8,006 in all—besides the advance party, of some 200 more. With my Wahuma guides, my Waganda volunteers, and my old and faithful followers, we must have numbered over 9,000 souls.

The Soudanese were located in five forts, extending, at an interval of two days' march between each, from the Albert to the Albert Edward Lake on the southern boundary of Unyoro, outside the frontiers of Toru; and Mr. De Winton was left in charge to try and introduce order into Toru, and, as the people flocked back to their country, to locate them and protect them from the license of the Soudanese, and from their enemies in Unyoro. I returned to Uganda, having been absent in all six months. During all this time Captain Williams had held his own amid the utmost difficulties in Uganda. He had but a mere handful of men, for out of the force I had left him he had sent 50 of the best to the coast with my urgent mails from Ruwenzori, and thinking I was in difficulties he had sent another 50 to reinforce me. These never reached me, and I met them on my return journey. Their despatch left him almost entirely without any force. The difficulties between the hostile factions—the so-called French and English, or Catholic and Protestant—became more and more acute. War actually broke out once. Day by day, almost hour by hour, he did not know what the morrow would bring. You cannot realise, but I can, the wearing anxiety of this constant weight of anxiety and responsibility, with nothing but inferior native food, little companionship, no adviser. But he never flinched, and he held his own by sheer resolution and pluck.

Meanwhile I was hurrying back. Not a day was lost, for I was anxious about Uganda, though I did not know that the force I had left with Williams were not with him still. I came just in time, and shortly after my arrival the crisis came, and the civil war we had both done our utmost by a whole year of patient effort to avoid was at last precipitated. Perhaps it was best in the end. I succeeded in separating the two hostile factions, and in giving them separate provinces. I brought back the hostile Mahomedan faction, for they agreed to my treaty abolishing all their raiding and export of slaves, and placed their king, by whom alone their faction was held together, in my hands. So religion is free in Uganda, and I hope! that henceforth the Christian parties will disassociate it from political ambitions, and that the Mahomedans, under British rule, will abandon all that is worst in the practice of their

religion and forbidden by the Koran, and learn and follow the true teachings of Islam, for which I have a great respect ; and so, under an impartial administration, Uganda will take the lead among African nations—the first Christian State, and the most progressive.

One word may be allowed me in conclusion, without touching on party politics. They talk of the evacuation of Uganda. God knows what chaos and anarchy and misery this will mean for Uganda. They will fight and cut each other's throats ; but for Toru it means massacre. I, who have done this thing—who have led these unarmed people to trust us—feel the responsibility for the people of Toru. England's responsible ministers only need to know what England wishes. They are but the executors of the will of the nation. Is it England's wish that a work which promises so well should be abandoned—that, having put our hand to the plough, we should now turn back ? This is not the way by which England attained the place she holds among the nations. I am confident that the voice of English public opinion will be raised against a measure so effeminate, so unjust, so un-English.



TWO NATIVE WATER CARRIERS JOINED BY RUBBER PLANT.

(Page 13, Mrs. French-Sheldon's Book. See pp. 145, &c.)

HOW A LACE CURTAIN IS MADE.*

BY MR. JOHN MORTIMER.

[Read to the Society, in the Library, Wednesday, December 14th, 1892, at 7-30 p.m.]

THAT familiar article of window drapery of the kind shown in the illustration, and known as a machine-made cotton lace curtain, is a tissue of comparatively modern date in the history of manufactures. The machine which produced it is a wonderfully complicated piece of mechanism, as we shall find when we come to examine it; but it did not spring into existence full grown and equipped for its work as Minerva the goddess of the arts and sciences did from the brain of Jupiter. It is an outcome of human resources and ingenuity, the consideration of which takes us back in one direction to Minerva's *egis* itself, inasmuch as the name is said to have been derived from the dyed goat-skin, with fringe upon it, worn by her worshippers. There is no doubt that one form of lace had its origin in the fringes which constituted the borders of garments, for as soon as those loose hanging fibres of which these fringes were originally composed came to be looped, interlaced, plaited, netted, or knotted so as to form open mesh-work, the foundation of border-lace making was laid. Lace of all kinds may be described as reticulated work—that is, having crossed lines so arranged as to form open spaces, capable, as we know, of infinite variety, from the plainest loop or mesh to the most complicated and elaborate interlacement of threads in artistic ornamentation. Apropos of definitions of net-work, there occurs to us here that curious one in which a net is described as something “with holes in it tied together by a string,” and also that other learned one by Dr. Johnson, who tells us that net-work is “anything reticulated or decussated at equal distances with interstices between the intersections.” All lace, then, is in some form or other net-work, though all net-work is not necessarily lace in the ordinary acceptation of the term. A fishing-net would hardly be regarded as a piece of lace-work, yet the first maker of such a net was a pioneer in that lace-making of which our modern lace curtain is one of the products. In this connection it is worthy of note as a curious fact, that one of the inventors of lace machinery, Robert Brown, of New Radford, Nottinghamshire took out in 1802 a patent for his invention of “a machine for the purpose of manufacturing, by this more speedy, simple, and neat method, fishing-nets, horse-nets, garden-nets, furniture-nets, nets for wearing apparel, and all other articles of net-work, having the same common diamond mesh and knot hitherto tied by the hand, with the netting-needle, in fishing-nets.” Then, again, we should not be disposed to regard a knitted stocking as in any sense a piece of lace-work, but it is nevertheless a fact, as we shall see presently, that in stocking knitting, machine-made lace had its origin.

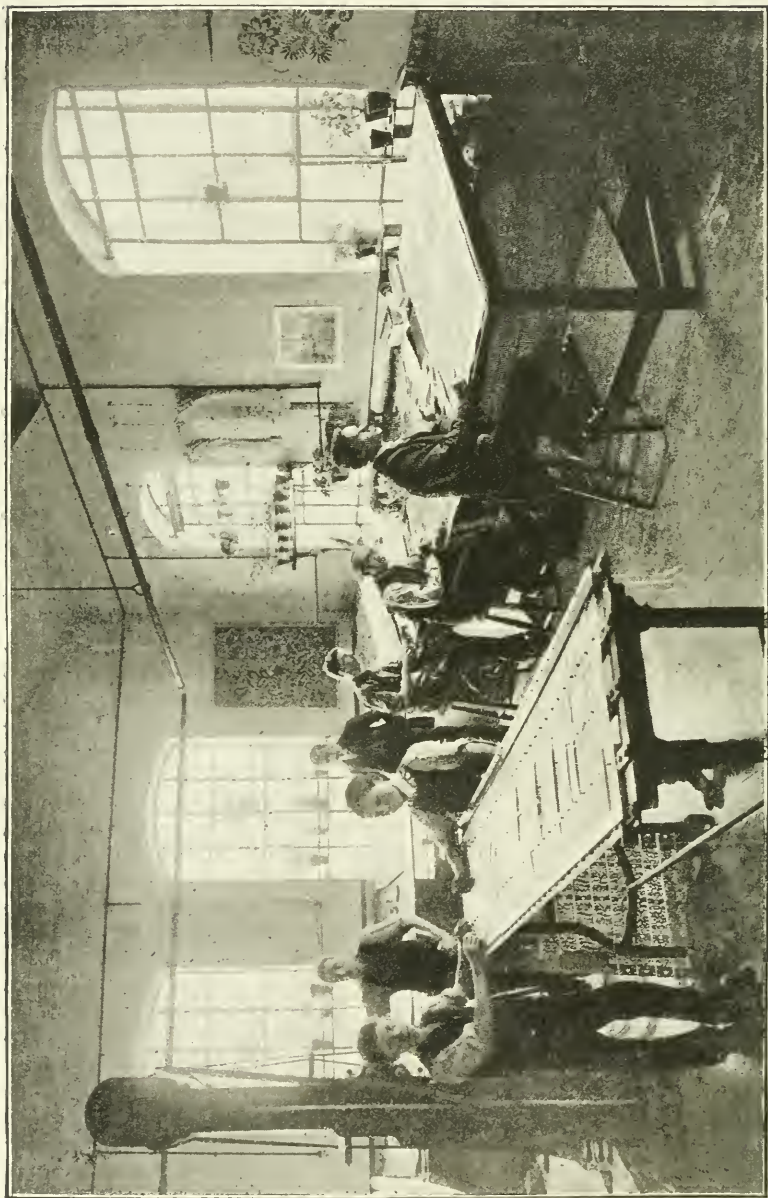
* This paper and the illustrations are very kindly placed at the disposal of the Society by Messrs. Henry Baunerman and Sons Limited. The papers published in this interesting series are—“Cotton to Cloth,” “Calico Printing,” “Fleece to Flannel,” “Flax to Linen,” “Concerning Velvet,” “Gold,” “A Factory Town” (description of Stalybridge).



LACE CURTAIN.

It is not necessary for the purpose we have in hand to do more than take the slightest and briefest glance at the antecedents and origin of machine-made lace. The making of great breadths of tissue in curtain form has been the outcome of the narrower kinds of lace-making; but though they have some features in common, the two processes are distinct in many particulars. The history of the art of making lace by hand is a very interesting one, but cannot be dealt with here. With edgings and other like border laces—Valenciennes, Brussels, and the rest—we have little or nothing to do, otherwise it might be shown how hand-made lace falls into two great divisions—needle-point and pillow lace. Needle-point, with its cut lace forms, grew out of embroidery; pillow lace, a later art, was constructed from threads drawn from bobbins hung round a pillow and crossed, according to the will of the worker, over pins stuck in front of the cushion. What is called bobbin-net in the machine form is the outcome of this pillow-made lace, and enters into some forms of curtain making. To what beautiful intricacies of design the hand workers attained, with their interlacements of thread in point and pillow lace is well known; but though the machines which afterwards took the place of human fingers were able to imitate these designs with more or less truthfulness, it was, as we have said, from the stocking knitter rather than from the hand-lace worker, that the idea of the first lace-making machine was gained. Knitting by means of needles consists in making and controlling the arrangement of a series of loops from a thread, but these loops are drawn pretty closely together, and do not assume the form of open mesh-work. As is pretty well known, the first stocking-frame was made at the close of the sixteenth century by the Rev. Wm. Lee, M.A., of St. John's College, Cambridge, and the origin of his invention has been associated with more or less of doubtful, picturesque, and romantic incident. From experiments on this stocking-frame, made somewhere about 1764, it was found possible to govern the movements of the needles and thread so as to produce interstices between the loops, and so form a *looped* net. Afterwards, machines were constructed by which a net was made of *twisted* meshes, like that of the hand-made pillow lace. The history of the inventions which succeeded these earlier efforts is a strange, eventful one, full of stirring and, in many cases, tragic interest. Ingenious men laboured and toiled under adverse conditions, and with varied results, to accomplish these interlacements of threads by mechanical means. Some achieved fortune and fame; but many of them broke their hearts in the effort, and ended their days in poverty and neglect, while others went mad or committed suicide. Little by little, by the selection of the fittest, by adaptation and combination, the lace-making machines as we see them to-day were constructed, and among them the curtain machine we are now about to inspect. It has already been said that curtain making is of comparatively recent origin, being, it would seem, of less than fifty years' date. In Felkin's "History of Lace-making" we are told that in 1846 a clever inventor, named John Livesey, "arranged a machine to make net-work composed of looped meshes. . . . Cloth and open work are interlaced in floral and geometrical designs, and thus curtains, antimacassars, &c., are made of any size or price. A pair of curtains, each four yards long, may be made on one frame in two hours. In the Exhibition of 1851 curtains, five yards long and two yards wide, each containing one elaborate pattern, were shown and valued at thirty shillings: the pattern required 15,000 cards to produce it."

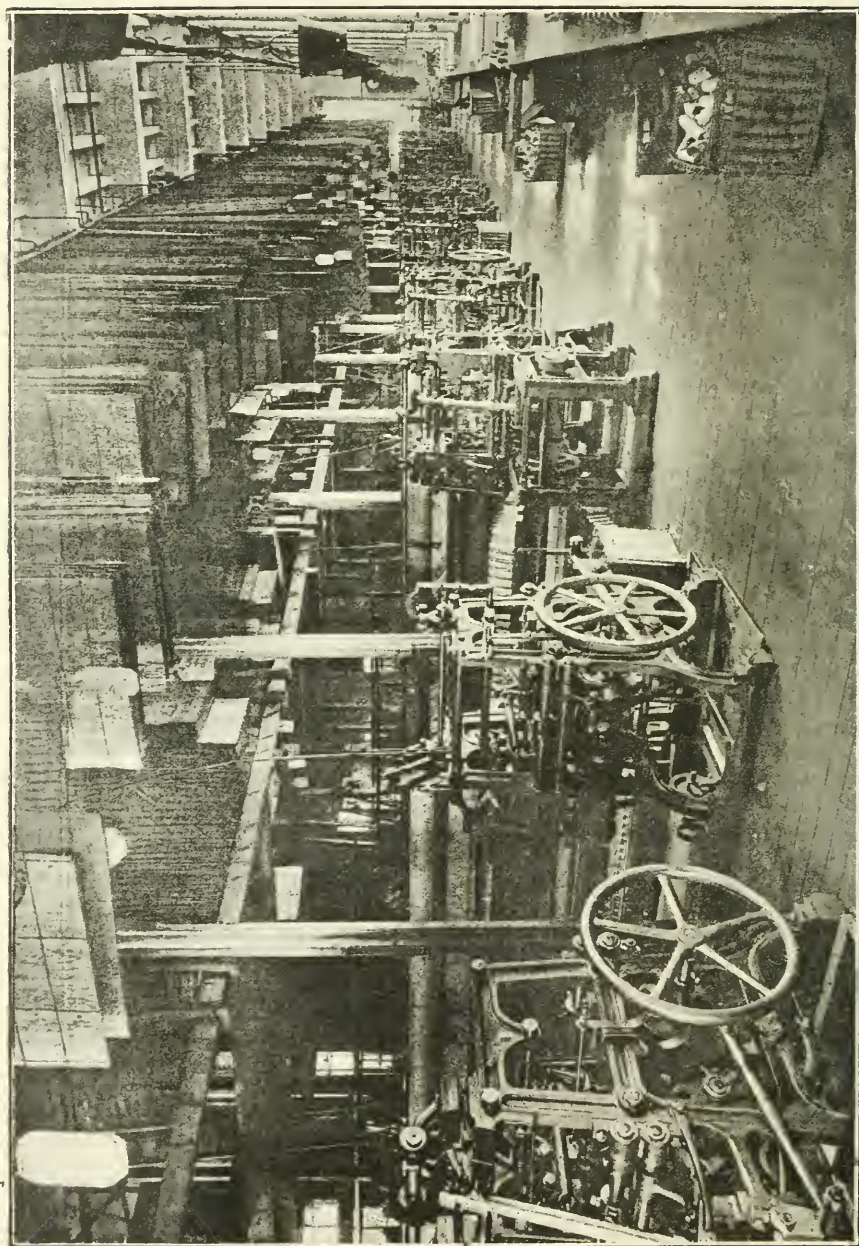
Before proceeding to make the acquaintance of our curtain machine, it will, perhaps, be best to deal with the preparatory processes of design and preparation for the intended work; and to this end we will, if you please, proceed first to the designers' room in the factory. This placing of a pattern on mesh-work is of course one of the most essential and important features in lace-making. It would seem that when the



DESIGN ROOM.

earlier experimenters had overcome the difficulty of making a mesh by mechanical means, they quickly turned their attention to the introduction of a pattern upon it, in imitation of the hand-worker's art. How wonderfully they have succeeded in imitating the most delicate and complicated designs of hand-made lace is well known, and in the doing of this the Jacquard machine has played a most important part. The application of the Jacquard process is absolutely necessary in the production of the patterns on our curtain, and what we are now to see is the arrangement for carrying that out. The designers' room is sufficiently removed from the din of the adjacent machinery to possess for itself something of an atmosphere of quiet repose. The taste for the beautiful in Nature which enters so much into the designer's art is shown in the presence of the plants in the window spaces. Those who are preparing the designs are seated at benches, arranged so as to get as much light as possible. The observer is first shown, displayed on a sheet of drawing-paper, the broad features of the design—floral it may be, or geometrical, or a mixture of both—brought out in white relief on a black background. There is a smoothness of outline in the design which we can scarcely hope to see represented in the ultimate tissue, by reason of the fact that the pattern will have to be displayed within a network of meshes. This breaking-up takes place when the design has been transferred and painted in colours (in a manner reminding one of the old patterns for wool embroidery), upon another sheet of paper, upon which, from a steel engraving, lines have been described, crossing each other at right angles, and forming minute squares arranged with mathematical precision. This sheet of paper, with the carefully depicted pattern upon it, is then taken to an upright frame close by, recognisable in the illustration, and fixed upon the front of it near the top, for the purpose of being "read." The reader is a specialist in his way, and the uninitiated observer will doubtless find it impossible to follow him very far in his reading. The object of it is to prepare the Jacquard cards, according to their order and influence in the development of the pattern and the process to follow, which is the punching of the cards. To the trained eye of the reader all those lines, squares, and patches of colour are as plain as the letterpress type on a page, and the process of reading goes on somewhat in this way. You see that the reader has, hanging from the frame in front of him, and beneath the pattern, a number of strings in the nature of whipcord. Transversely to these, on one side of the frame, are other similar cords. It is explained to you that the lines in the pattern represent lines in the curtain, and for every one of them there is a cord. The reader is engaged in so arranging the cords, that they will represent the pattern to the extent of exercising a controlling effect in producing punched cards, every card of which will represent one motion in the building up of the pattern in the machine. You see the reader deftly and rapidly working with his fingers among the cords, separating some and taking up others, and getting them into groups, at the same time forming a kind of interlacement with the transverse cords, so as to show in a rough way something of the pattern before him. You may not be able to penetrate the mystery of these movements, but you cannot fail to wonder at the skill and dexterity with which they are accomplished. You can easily understand how rapidity is of the essence of the reader's work, when you are told that he is paid at the rate of so much for every 100,000 squares of the pattern which he has to read.

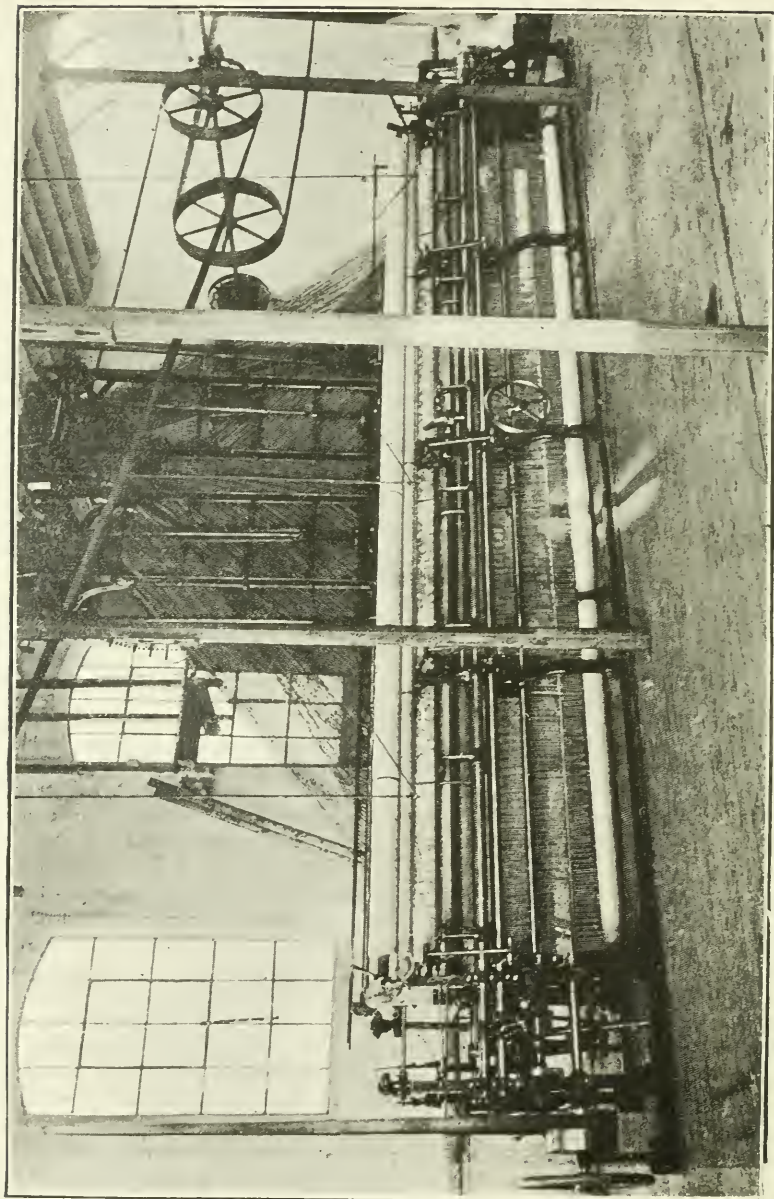
When the reading is finished, these carefully grouped cords are taken and laid on a long horizontal frame, called a "selector," to which at one end is attached a punching machine. It is then explained to you that, according to the order in which the groups of cords fall, so will each group be made to act upon punches to which they have been connected, and in such a way as to perforate the required number of holes in one card. As each group is in its order taken up, you see that by a treadle move-



CURTAIN MACHINES.

ment the cords are made to act upon the punches, and simultaneously with each sharp sound of perforation a card drops from the punching-box into a receptacle beneath. These cards, of course, are made to follow each other in strict sequence, according to the design. If you examine them you will find that the perforations differ very much in their numbers, and you are told that the flat spaces represent the open work in the pattern, and the holes represent what is called the cloth work, each hole being referred to as a tie or loop. This is further explained by the fact that if *cloth*-ing only is required, then, fully perforated cards are used, and if the work is to be wholly of net, alternately perforated cards are used. These cards vary in number, according to the size of the pattern, and may reach, as we have seen, as many as 15,000 in one design. To work out the pattern of the curtain shown in our illustration 2,130 cards were required. When all the required cards have been punched, they are numbered and carefully laced together, so as to produce a hinge-like movement in the lacing, which will enable them to travel round the Jacquard box. We shall make their acquaintance again when we come to the curtain machine; but in the meantime it will be as well to anticipate a little and turn aside to see a testing of these cards in their working. From a given arrangement of them a test pattern has been made and is exposed to view, stretched upon a kind of blackboard, there to be compared with the original design. This particular kind of examination is undertaken to remedy any defects there may have been in the arrangement of the cords, or the punching of them. There is no such thing as absolute freedom from slips or error, where the human fingers are concerned, and here you are shown how, by some slight deviations, differences have been made in the pattern. There is an ellipsis in it which ought not to be, a hole where there should be cloth, or the reverse. To remedy this the examiner, by carefully counting the lines or squares in the design, can put his finger upon the card and the special defect. This may take the form of a perforation where there should not be one, or a punching has been omitted. If there is a superfluous perforation he cleverly fills the space up, or punches a hole where necessary.

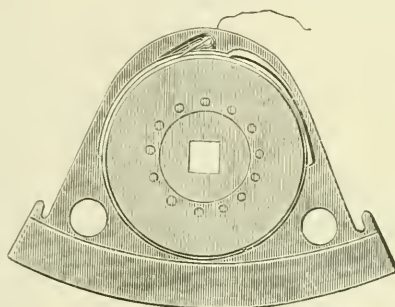
Having seen the preparation of the design for our curtain, we may now proceed to the examination of the materials of which it is to be composed, and the methods of dealing with them. Our curtain is to be constructed out of cotton yarns, and on your way through the factory to see the preliminary processes, you will pass by piles of bundles of these yarns delivered by the spinners in hanks. All these yarns are doubled, but they differ in counts, quality, and degree of twist. To make our curtain, three different threads of yarn will be required—one for the warp, one for the bobbin, and one for the spool or weft. The bobbin yarn will be the finest, the warp of medium quality, and the spool of a coarser kind. Where necessary the thread is *gassed*—that is, passed through gas flames to remove the superfluous fibres from it. The hanks having been taken from the bundles, the first process is to wind them on what are called spools, but which may be more familiarly described as ordinary wooden bobbins. To effect this the hanks are taken to the winding machines, and there stretched round skeleton drums, from which the threads are guided over a bar or plate having a sliding or traverse movement, and so are wound regularly and evenly upon the bobbins ranged upon spindles in front. All these winding machines are tended by women. The threads intended for the warp are then taken to be wound upon a warping mill, which may be described as a long horizontal and circular frame of open woodwork, possessing a revolving movement. To do this the spools are placed on spindles and ranged in tiers on a creel or frame, and the threads are drawn so as to converge and pass separately through perforated brass plates called warp brasses, and thence to the revolving mill, where they are placed in regular order, side by side. When the warping mill has got a sufficient number of threads upon it, these are guided back again,



CURTAIN MACHINE.

and wound upon a long roller called a warp beam. This beam is now ready to take its place in the machine. Upon other winding machines the weft thread has been wound, and this is left upon the spools. The bobbin thread, which is the finest of all, is wound in a similar way; but is sometimes subjected to a process of flattening by pressure, so that as much as possible may be got on the bobbins.

This bobbin is such an important factor in the process of lace curtain making, that we must needs stop to examine its construction before seeing the thread wound upon it. It consists of two flat circular brass discs placed close to each other, and within a groove between them the thread is wound. When you see it at work in the machine it will perhaps interest you as much as anything you will find there. In the meantime, as we watch the woman who is winding the thread upon these bobbins, we note that she has before her a crescent-shaped arrangement of wooden bobbins. From these the threads are drawn and guided between wire combs and in various other ways, until having passed round a drum or cylinder they eventually glide into the respective grooves of the closely ranged metal bobbins, which have been threaded together, as it were, on a revolving spoke placed through the square hole in the centre of each bobbin. These bobbins may number 140 or more, and may each hold from 94 to 112 yards of thread. As the threads pass into the bobbins the attendant occasionally rubs grease



BOBBIN AND CARRIAGE.

upon them to facilitate the operation of winding. There is a dial-plate affixed upon this winding engine, showing the number of yards wound, and when the attendant sees that the required quantity has been placed, she manages deftly to change the bobbins without breaking the continuity of the winding process.

The full bobbins have now to be put into their steel carriages, and they then present the appearance shown in the illustration. This bobbin carriage is made with a space within it to receive the bobbin, and by a sharp and clever movement, the discs are slipped on to a verge or flange on the lower side of the orifice, and then brought under the influence of a strong steel spring, with a nib at the end of it, which goes inside the groove of the bobbin on its upper side, and by its pressure regulates the delivery of the thread, which is passed through an eyelet-hole on the upper side of the carriage. The bobbins are put into the carriages by youths, whose dexterity is something wonderful to behold. The operator, with the bobbins and carriages lying separated on the bench before him, brings them into their due relationship with the rapidity of a conjuror performing a trick. If the observer wishes to realise the smartness of this operation and what goes to the performance of it, he cannot do better than try the experiment for himself. These youths take the empty bobbins from the machines and replace them with full ones. When the bobbins have been



EXAMINING CURTAINS.

fixed, with their springs duly adjusted, the thread is passed through the eyelet-hole by a smart movement over a hook projecting from the top of a peg fixed in the bench.

The three kinds of thread—warp, spool, and bobbin—required to make our curtain having been thus prepared, they are all taken to the curtain machine, to be looped, twisted, and brought into intimate relationship in various ways so as to make the required tissue, with its artistic arrangement of design. When you enter the room in which these curtain machines are placed—to the number it may be of fifteen, as in the room shown in the illustration—the first impression, probably, that you will get will be of the magnitude of them, so much wider do they appear than the widest weaving-loom, and possessing, as they do, from 240 to 300 inches of actual producing space, the width and number of curtains to be made at one time being arranged according to requirements. You may note here by the way that the operative in charge of the machine never alludes to it as a loom, but rather rejects such an appellation; he is a lace-maker, and therefore speaks of his curtains as made, not woven. You are still further impressed as to the valuable mechanism of such machines, when you are told that they cost from £700 to £1,000 each. This mechanism is of a very complicated kind, and an outsider who possesses no technical knowledge relating to it cannot hope to get more than general impressions of the work being done. In this curtain machine you have the concentrated and combined results of many inventions, the selection and survival of the fittest means to the accomplishment of one end. These accumulated forces are all so carefully adjusted as to nicety of movement, time and order, strain and tension, with a general harmoniousness in the result, as to give you the impression of a conscious intelligence in the whole. An idea of the general appearance of the machine will be gained from the various illustrations. It shows in the main body of it a long framework, with a warp beam or roller at the foot of it in front; above this, midway on both sides, are grooved bars curving inwards, and elbow-like projections placed at regular intervals. In the centre are horizontal bars and needles, and above them two rollers in close connection, upon the upper one of which the curtain will eventually be wound. At each end of this framework there is a complicated arrangement of wheels, cams, levers, springs, and other forms of mechanism. These are the controlling and guiding forces with regard to all that goes on in the framework between: constituting a process of action and reaction, subject to other modifying influences from the Jacquard machine, which works in a sort of independent way from above. This Jacquard machine, in the present case duplicated in order to do special kinds of work, is to be seen looming up overhead, and is reached by a ladder and platform arrangement. To these machines are taken the punched cards which we have seen prepared, and they are so arranged as to revolve in their due order over the Jacquard box. As they present blank spaces or holes so do they affect needles projecting from the box; these needles in their turn influence the movements of levers, which act upon cords attached to them, and which reach down to the wires called “jacks,” which in their turn influence the movements of the spool threads in the machine.

The next thing to be noted is the arrangement in the machine of the threads, warp, bobbin, and spool, which, in their interlacement, are to form the tissue. In this relation you see that the warp beam with the thread wound upon it is placed at the foot of the machine, and that, through a guide-bar, the threads move upwards in straight lines. Now, if you examine a curtain such as that which is here to be produced, you will see that these warp threads are traceable all the way through the length of it. They are technically called the pillars of the curtain, and between, and upon them, the pattern has to be built up by the other threads. This idea of a pillar helps you wonderfully in the way of understanding the nature of the process. The

distances between the pillars are spoken of by the operator as "gaits"—*gait* being another form of the word *gate*—so in the various gateways between these upright pillars of thread the cross threads have to be arranged. The warp thread having been disposed of, the spool thread, we find, is taken to the rear of the machine, and there the bobbins arranged on spindles are seen displayed upon two trays or platforms, one above the other. This spool thread, as we have said before, is to form the interlacement between the pillars, the net-work, or where more thickly introduced, the "clothing," as it is technically called, of the design. These spool threads are conducted, so as to be influenced in their movements, by a guide-bar, upon which is arranged a row of upright needles, through which the threads are passed. They are also subject, as we have said before, to the influence of the jacks, a horizontally bent wire of one of these jacks being placed by the side of each thread. The destiny of the third kind of thread—the bobbin thread—is a curious and interesting one, and the work it has to do equally so. We have seen the bobbins put in their carriages, and when next we see them in the machine we find that they are ranged together with their flat surfaces side by side, and are suspended by their various threads like so many pendulums, and in such a position as to act upon the warp and spool threads. The arrangement of all these threads in the machine is uniform as to numbers. If there are 3,000 threads of warp, there will also be 3,000 each of bobbin and spool threads.

When the machine is at work, what you see going on is something of this kind. The warp threads are moving upwards as they are being unwound from the warp beam. The spool threads are being delivered towards them from behind, and the bobbins in their carriages are swinging to and fro—three thousand, it may be, moving like one—and each bobbin, in its pendulum-like swinging, is sliding in and out of a groove of a comb on each side of the machine. The pendulum-like movement of the bobbin threads is effected by alternate thrusts upon the carriages from two long horizontal bars, called catch-bars, to which are attached those jointed elbows which we noticed projecting from the sides of the machine. The threads from the bobbins are acting separately upon the threads of warp and spool so as to tie them together in such relations as the pattern may require. This process of tying-up is a remarkably interesting one, and the discovery of the way to do it was the solution of one of the most difficult problems in lace-making. It is accomplished by moving the warp threads sideways, by means of a sliding horizontal bar, through which they have been threaded, and so changing their position to right or left as to allow the bobbins and carriages, in their swinging, to pass on each side of them, the effect, of course, being the same as going all round them. It will be seen from this that when a spool thread has been brought into relation with a pillar of warp thread, it is possible to tie it at the point of contact by means of the twist of this bobbin thread round it and the warp thread, and by this sliding-bar movement, as applied also to the spool thread, to carry the threads between the pillars diagonally or straight across and tie them in as needed. If you take a piece of curtain of a loose make and pull the spool threads from the warp, you will be able to detect the presence of this looping bobbin thread. Along with these sliding-bar movements there are also those of the Jacquard machine, which, in obedience to the instruction, as it were, of each card, is by means of jacks influenced by these cards, so disposing the spool threads that cloth or meshes of net may be made as required. The spool threads, as already stated, are passed through the guide-bar, which exercises one form of control over their movements. Above the guide-bar the jacks are placed, each one, as has been said, with its bent horizontal point resting beside each spool thread in a restraining manner. These threads, passing through the guide-bar and up the sides of the jacks, would, if left to proceed on their

way without lateral disturbance, get twisted with the warp and bobbin threads, and so form the pillars of the net. But, as lateral movement is required to cross the threads from pillar to pillar, the guide-bar accomplishes this in its sliding movement, and the jacks, as influenced by the withdrawing action of the Jacquard cords attached to them, perform the work of selecting the threads that are wanted to form the pattern, so—as it is explained to you—“when the jack is drawn back then the spool thread is set at liberty, and immediately the guide-bar moves, it passes across the front of the jack and is twisted in with the next warp and bobbin thread, and then as the guide-bar goes back to its place the spool thread is passed back, causing a tie across, and so forming the pattern.” Some of these movements are so arranged that the spool threads may be taken over several “gaits”—that is, across several pillars of warp before being tied. When there is light and shade required in the *cloth*-ing, two Jacquard machines are used, and this is spoken of as a double action.

Among the many complicated movements your attention is specially directed to those of the sliding horizontal bars, which play such an important part in dealing with the threads, spool, or warp. These movements are differentiated by cams, which are to be seen among the wheels at the ends of the machine. To the uninitiated eye a cam presents the appearance of an irregular wheel-like surface, with abrupt curves and other variations. These are made to act upon other surfaces and so produce special movements, and among others you hear of one called a “shogging,” or jogging kind of movement. How far a merely technical explanation will help you to understand these bars and their “shogging,” may be illustrated by an extract from the written memoranda of instructions taken from an operative's pocket-book, a diminutive volume consisting of a few pages, soiled and thumbed by frequent use. The instructions, which relate to the “back point-bar,” as they are written, run thus: “This bar shogs one gait to the right hand (standing in front of the machine), and must finish shogging before entering the bobbin threads. The bar must then go up and remain in that position until the front bar begins to rise and has passed the threads. It must then commence to pass gradually to the left hand until the front bar has risen up to it. The back point will then be exactly near the front points (if it is moved the correct distance), and not between, as they otherwise would be before the front bar gets to the surface; the back bar points will have just drawn out the other shogging half gait to the left hand so as to fall between; the points of the front bar must be quite clear of the net first.” Though you may not be able to understand all that is told you regarding these bars, cams, jacks, and the rest, and though the exact point of construction may have something of mystery about it as regards its details, which are being worked out so rapidly, still you may get, if only in a dim way, a notion of the complexity and delicacy of the machinery which is dealing with the three kinds of thread and interlacing them, so as to produce that light and ornamental web which is seen emerging and developing line by line, after leaving the two rows of needle-points which give the last touches to the tissue in their alternate pressure of the meshes upwards. As it rises in the machine the curtain is laid hold of by the prickly surface of what is called a porcupine roller, and from it passes to another roller above, upon which it is wound. We have used the term rises, but the fact is, that the tissue is being drawn up by the lower, or porcupine roller, the drawing power of which, being regulated in its tension by toothed wheels at the ends of the machine, really decides by its action upon the threads, the manner, loose or otherwise, in which the curtain shall be made. It may be noted here, that on this modern curtain machine, two and a half pairs, and sometimes three pairs of curtains, are made in half an hour, the time, however, being regulated entirely by the quality of the curtains.

After our curtain has got itself made, it is necessary that it should be examined in order to ascertain whether any accident has happened to it in the machine, rendering it in any way imperfect. For this purpose it is taken to a room like the one shown in the illustration, in which a number of women and girls are seen, seated among apparently tumbled and confused heaps of curtains, lying all about them, and here in the hands of one of these needlewomen it is closely scrutinised to detect any broken threads or other like defects. If any such be found the mischief is carefully repaired, and then as a passed article of marketable value our curtain has a ticket placed upon it, fully descriptive of its origin, quality, and other needful particulars. It is a rather limp, greyish-looking object at its present stage, in need of a certain amount of washing and dressing. In some cases the grey look is maintained or emphasized, in the effect known as *écru* ; but as it is intended that our curtain shall be made of a spotless white, it is now passed on to the bleacher for that purpose. We need not follow it in detail here, but as we pass the bleachworks we can hear the heavy beetles pounding away upon its threads. When next it is seen, we find ourselves and it exposed to very heated conditions. It is being passed through a starching machine, and having had the stiffening material imparted to it, we see it subjected to squeezing conditions among rollers and cylinders. After passing this first stage it is taken up by girls and conveyed to a long stentering machine, on the sides of which they fasten it to pins. The effect of this machine, by a peculiarity in its construction, is to take the curtain along in a travelling fashion and gradually draw it out to its proper width without undue strain upon its meshes. While it is being thus drawn it is also being dried—the stentering machine, which is of great length, having the greater part of it placed in an exceedingly hot chamber, the heat of which is almost unendurable to the unacclimatised visitor. From this machine it is passed through another roller and cylinder arrangement, and then delivered, in a dried and stiffened condition, in gentle and regular folds. Adjoining this hot chamber is another one possessing a more endurable atmosphere, in which many women and girls are to be seen employed in various finishing operations. In the hands of these female workers our curtain will have its edges scalloped and taped, and will be dealt with in other ways, until at last we see it pressed and folded, and prepared to take its place upon the draper's counter.

In this endeavour to convey, within necessarily narrow limits, some slight information regarding the way in which a lace curtain is made, it has been thought desirable to base the description upon one of an average and ordinary make. It will, of course, be understood that in curtains of a higher and more elaborate kind, differences of construction occur, and combinations in the machinery are introduced, into the details of which it is not possible to enter here. Sufficient, however, has perhaps been written to show what skill and mechanical ingenuity are required to produce an article of ordinary household adornment. One cannot help being impressed also with the contrast between the cost and supply of hand-made lace and that produced by machinery, when one remembers—taking an extreme case—that it is on record that a certain lace merchant of Venice made a profit of 75,000 francs in the way of commission upon a set of hand-made lace bed-hangings for the Emperor Joseph II. of Germany, and that a pair of machine-made lace curtains, such as are shown in the illustration, can be had for a comparatively few shillings.

"COLUMBUS."

By the Rev. S. A. STEINTHAL, F.R.G.S., Chairman of the Council.

[Addressed to the Members in the Music Hall at "Old America," in the Botanical Gardens, Old Trafford, at the Columbus Celebration, on Wednesday, July 27th, 1892.]

WE are met this evening to celebrate the four hundredth anniversary of the discovery of America, and to commemorate the great achievement of Columbus. We are so accustomed to the present condition of geographical knowledge—giving us, at least, a fair acquaintance with the outlines of the earth's form—that it is not easy for us to imagine what it must have seemed like in those ancient days, when men believed that if they were to sail beyond Cape Bojador they would pass into a region of fiery heat unbearable by man, or if they pressed on into the North would find themselves in utter darkness; while fancy peopled the Western Sea with demons, impracticable shoals, and unspeakable dangers. I have been asked to say a few words by way of introduction to the more immediate subject of our evening's consideration, that we may more fully measure the value of Columbus's great achievement. There were explorers before him, though none had dared what he accomplished. When first man ventured to sail upon the sea no one knows, though we have evidence to prove that it must have been in almost prehistoric days that the Phœnicians had their trading vessels upon the Mediterranean, and that vessels laden with merchandise sailed from the ports in the Red Sea to Arabia and the East Coast of Africa, and from the Persian Gulf to India, if not to still more Eastern ports. Homer speaks of the Phœnicians as bold pirates and traders more than 1,000 years before Christ; and we have reason to believe that, before Saul ruled as king over Israel, their daring seamen had ventured beyond the Pillars of Hercules, and had founded colonies upon the Coast of Spain and on the West Coast of Africa—perhaps even reaching the Canaries. Herodotus tells us that, at the request of Necho, king of Egypt, 616 years before Christ, an expedition of Phœnicians sailed from the Red Sea along the Coast of Africa, and, after three years' absence, returned to Egypt by way of the Pillars of Hercules, having circumnavigated Africa. He tells us that each autumn they landed and sowed the ground, awaiting the harvest before they set sail again. The only thing about the journey which seems to have aroused any doubt in his mind was that the travellers asserted that in sailing round Libya they had the sun on the right hand—that is, in the north—which, he says, is not credible to him, but may be to some one else, and certainly will hardly surprise anyone that remembers that they must in their course have crossed the equator. Strange it is to note how this great discovery was allowed to sink into oblivion, and for two thousand years the Cape was hidden once again in darkness. But all along the Mediterranean the Phœnicians left the mark of their adventurous spirit—on Cyprus and on Crete, on the Southern Coast of Greece and Italy, in Sicily and the Balearic Islands, far away on the Canaries and Azores, and nearer to their own home on the North Coast of Africa. Their colonies bore witness to their courage and enterprise, and added to their wealth and power, until the conquest of Alexander overthrew their cities, and gave the maritime supremacy to Greece. Carthage, it is true, maintained the Phœnician tradition of commercial enterprise and maritime daring. One of her great leaders, Hanno (it is difficult to say in what year), rivalled the adventurous explorers of the East Coast by sailing along the West of Africa, and reaching what we now call the Gulf of Guinea, reporting phenomena

which once were not believed, but which later explorers fully confirmed, and bringing descriptions of what he and his companions believed to be a tribe of wild and hairy men, which we can clearly see must have been the untameable gorillas, which remained unknown to science till De Chaillu, after more than 2,000 years, called our attention to them. But Carthaginian rivalry of Greece was overthrown by the Romans, who now took the place as explorers which the Punic race had filled; but as an inland town, though Rome might rule the known world, and be the mart to which all merchandise was brought, it never came near to Corinth, Athens, or Alexandria as a centre of trade. It would be easy to detain you the whole evening were I to try and tell of the trade routes which led from the coast of the Black Sea to the Caspian, through Persia and Central Asia to distant China and India, or to tell of the intercourse of Arabian traders along the Persian Gulf with the rich peoples of the Indian Seas. When first these caravan routes were used by Arab traders it would be hard to say. Whatever the higher criticism may be pleased to say as to the date of Genesis, the fact that when it was written Ishmaelite traders were in the habit of carrying spicery, balm, and myrrh down into Egypt shows that while the Phœnicians were coasting the Mediterranean shores, and bringing what the West could supply to market, the Arabs were opening up the vast stores of Eastern wealth to Western traders. When Byzantium became the capital of the Roman Empire its fortunate position made it the centre of the world's commerce, and this position it maintained until the rise of the Western kingdoms changed the balance of power, and Germany, France, Spain, and Portugal, as well as the Italian republics, became the leaders of civilisation. For a time we hear nothing of maritime progress or discovery among the nations which used to lead the way, but the prominence in naval adventure is transferred from the dwellers in the Mediterranean to the inhabitants of the lands bordering on the North Sea. In the Saga of the Northmen we do read of strange adventures. A Viking colony was founded in Iceland as early as 874 of our era, and Eric the Red, its ruler, is said to have established a colony on the West Coast of Greenland, in 986, at a place which it is thought is the modern Tunnudliorbik, in the Julianshaab district, in latitude $60^{\circ} 35'$. In modern days many vestiges of this colony have been discovered, one inscribed stone bearing as late a date as 1135. Among the companions of Eric was a man named Herjulf, who took all his family with him, except one son, Björn, who was away from Iceland on a trading expedition at the time. When he returned and found that all his relations had left Iceland, he started in search of his people. If the story told of him in the *Heimskringla* be true he must have seen the coast of Newfoundland or Labrador, as he was driven by contrary winds to a coast which, he was convinced, could not be Greenland, and leaving it to port he sailed with a south-west wind till he reached the place where he found his father. About the year 1000 Leif, the son of Eric, ventured forth on an expedition to find the land which Björn had seen, and discovered a country which he called Hellaland—the Land of Stone—over 600 miles from Greenland. Still pressing on, he reached a well-wooded shore, which he consequently named Markland; and after a further sail of two days, before a north-east wind, he entered a channel between an island and the mainland, where the river fell into the sea, and on these he wintered. Salmon was plentiful, and all through the winter the grass remained fresh. There are various opinions as to where this first settlement was made, but it must have been somewhere on what is now called the New England Coast. The explorers who were sent inland brought back wild grapes and grain, and the Northmen gave the country the name of Vinland. Expeditions which were made in subsequent years brought the Northmen into collision with natives, whom they call “Skraelings,” or dwarfs. Modern authors believe that these must have been Esquimos, but, if so, it

needs explanation how they should have found their way so far south, especially when we are told of one of the winter settlements where they first traded with, and afterwards fought the Skraelings, being so warm that no snow fell and the cattle remained in the fields. What the end of these expeditions was no one knows, but it is strange that nowhere on the North Coast of America, except in Greenland, have relics been found of Scandinavian settlements. The record is, however, in the *Heimskringla* Saga; and as Columbus is said, in his early maritime life, to have visited Iceland, and even to have sailed a hundred leagues beyond it, some writers have believed that the tale of these early voyagers may have been one of the many facts which suggested his western journey, for many things are told which combined to make him think that beyond the Western Sea land would be found:—the ancient myth of the Island of Atlantis, which was said to have been opposite the Pillars of Hercules, and rich in all pleasant fruits and mineral wealth, with cities wondrously built with temples and palaces and gardens, and inhabited by men with wise and excellent laws. This fair realm was said to have been destroyed by an earthquake; but, still, many dreamed of its continued existence, and legends of the Hesperides with golden apples, and of the fortunate islands with their blessed inhabitants, ever and again encouraged men to think of what was hidden in that shoreless sea which washed the Western Coasts of Europe and of Africa. In Christian myths as well, this dreamland rises. The dwellers on the Canary Islands, every now and then, saw the Isle of St. Brandon “stretching away in the dear bright west;” and seamen launched their boats to reach its shores in vain. I could tell strange tales of the few who are said to have landed there, and found years passing away like hours beneath its enchanting skies; but my task is a more sober one, and I have not time even to tell all that I would like of the active work of commercial enterprise which characterised the growth of the great Italian republics. When the savage hordes of Attila and Alaric overran the Roman Empire, and subdued the cities on the mainland, many fugitives took refuge from the invaders on the islands which fringe the north-west of the Adriatic, and founded the republic of Venice, which, owing to its geographical position, soon rose to commercial prosperity, and became one of the great mediums of the traffic from the Levant—a rival of Pisa and Genoa, which had preserved from early days a constant intercourse with Constantinople and Syria, so that these three cities had more vessels in the Mediterranean than the whole of Christendom besides. When the Crusades aroused the Western world to war with the Saracens these cities were the means of supplying the fleets which transported the Christian warriors to the Holy Land, and in payment secured great privileges, which they preserved as long as the kingdom of Jerusalem lasted. Early in the 13th century Dandolo, the Doge of Venice, headed one of the armaments destined for Jerusalem, but turned aside and overthrew the Byzantine emperor, securing for Venice the Peloponnesus, Cyprus, Candia, and the Ionian Islands, and establishing stations of great mercantile importance on the shores of the Black Sea. How valuable these conquests were for commercial purposes may be gathered from the story of Marco Polo, which shows what daring enterprise animated the citizens of the republic on land as well as on sea. I shall not speak of Venice’s great rival, Genoa, as that will form Chevalier Froehlich’s theme, except to point out how the rivalry of Genoa led to the war in which Marco Polo was taken prisoner, and while in prison was induced to dictate to a fellow-captive that wondrous tale which inspired so many adventurous minds with the desire to find some route less dangerous and difficult than the long journey across Asia to reach the golden Chersonesus, the Island of Cipango, and the rich spice islands and opulent shores of the Indies. When the Turks had taken possession of Constantinople and the whole east of the Mediterranean, the traffic with the far East became more difficult; and

while crusading had made the Europeans more dependent on Asia for luxuries which could not be procured elsewhere, greater obstacles were placed in the way of communication, which caused men to think more and more whether it was not possible to find away of reaching the East by sea. To one man above all others was this thought ever present—to Prince Henry of Portugal, known to all after ages as Prince Henry the Navigator. We in this country have special reason to take an interest in his story. He was the son of King John of Portugal, surnamed the Great, and Father of his country, under whose reign Portugal first won the high position she held for so many years as one of the most powerful and wealthy of European nations. The Moors had been driven out of her territory, and the King of Castille—who, having married the widow of Pedro, John's father, had tried to win the throne of Portugal—was defeated by John, the regent of the kingdom, at Aljubarotta, some sixty miles from Lisbon, in a decisive battle, in which English auxiliaries played a not inconsiderable part. John was an illegitimate son of Pedro; but his courage and sagacity had won for him so great a hold upon the love of his fellow-countrymen that, though some of the nobles of the realm wished him only to keep his title of regent, the Cortes declared him king of Portugal. He was preparing to continue his contest against Castille, when he received the news that John of Gaunt, "time-honoured Lancaster," was preparing to invade that country, to enforce his claim upon its throne by the right of his wife, Princess Constance, the daughter of Pedro the Cruel. John hastened to the Duke of Lancaster at Corunna, and, to seal the alliance between the two princes, Lancaster gave John his daughter, Philippa, in marriage. The king of Portugal had been the grandmaster of the Order of Avis, but on becoming king the Pope dispensed him from his vow of celibacy, so that there was no obstacle to prevent the alliance, which proved a source of real good for the king and his country, as the queen, during the twenty-eight years in which she shared the throne, made herself beloved by all her subjects, and displayed such wisdom in the education of her children as to make them share the high tone of her own noble character. The war against Castille was, however, not successful in securing the throne for the English prince, who made peace with his rival by marrying his second daughter, the half-sister of Philippa, to the Prince of Asturias, the heir to the throne of Castille. The connection between Portugal and England was promoted in the most cordial manner. King John was made a knight of the Garter, being the first foreign sovereign on whom that honour was conferred. The friendly union of the two crowns had in very early days been cemented by many political and commercial treaties, and it is only of late years that this cordial alliance has been less cherished, and difficulties have been allowed to rise between the two countries. The marriage of King John was blessed by eight children, of whom Henry was the fifth, born in Oporto on the 4th of March, 1394. Like his brothers, he was trained in every knightly accomplishment, but in addition he had a special love of mathematical and astronomical studies. His war-like abilities he had an early opportunity of displaying by the part he took in the capture of Ceuta, when his father carried his arms across the Straits of Gibraltar, and gave his sons the opportunity of earning their spurs in actual war instead of in the lists at a tournament; and gallantly did they win the dignity of knighthood. So high a reputation had the prince achieved that he was asked by several courts to take the command of their forces, but he had set his mind on an achievement of another kind. He longed to examine the African coast, and to find out whether there was not a way round it by which his ships could reach the wealthy realms of India and Cathay, and obtain the stores of gold dust, of jewels and of spices—those riches of the far east which were brought by caravans to the shores of the Mediterranean and gave their wealth to the Mohammedans, who had for generations sup-

planted the Christians in the Levant, while the carrying trade from Constantinople and Alexandria, and the intermediate Syrian ports, was altogether in the hands of the Italian republics. The Moorish courts in Spain and Portugal had accustomed the people to the use of Oriental luxuries, but the conflicts with the Moors had prevented their obtaining them as in the olden time when Moorish rule was undisputed. The wish to find a new route by which they could be again procured was a natural result of the long years of warfare. At Ceuta, Prince Henry heard of the wealth which the caravans were wont to bring from Timbuctoo and lands beyond, and of rivers which fell into the sea south of Cape Non, which till then was the southern limit known of the African West Coast. He sent ships year after year to try and discover a route which would enable him to reach the East by way of Africa. He settled down at Sagres, one of the southern promontories of Portugal, a barren, rocky cape stretching out into the unknown Atlantic. Here he established a school of navigators, collecting such scanty astronomical instruments as could then be obtained, and as large a number of maps and geographical works as were to be obtained in those days. Amongst these treasures, one work which was of especial value to him was a copy of Marco Polo's *Journey*, which his brother, Don Pedro, had brought with him from Venice, together, it is said, with a map, ascribed by some to that great traveller himself. He was possessed, as the Grandmaster of the Order of Christ, as Duke of Viseu, and Governor of the Algarves, of great wealth, and all that he possessed he spent in equipping expeditions of discovery. Though he was surnamed "The Navigator," he himself never went on any exploring expedition, but his energy and enthusiasm inspired his captains with courage and daring, and both were needed for the task. Think of what his ships were—vessels in which I hardly think anyone would now dare to cross the Channel; with room perhaps for thirty or forty seamen; with none of the appliances which now every small coasting vessel has; with a rude mariner's compass and an astrolabe as the only instruments at their disposal; no charts, no telescope, no log, and before them a sea about which all manner of strange wild stories were told. You can imagine what spirit and faith were needed to encourage men to leave sight of land and take their way into the unknown. Year after year new adventurers went forth to penetrate the mystery that hid the African coasts. The first discovery which rewarded Prince Henry was that of the islands of Porto Santo and of Madeira in 1419. Two of his squires were trying to explore the coast of Guinea, but were overtaken by a storm, which drove them from the coast to the island they named Porto Santo. Prince Henry received so favourable a description of the island that he determined to colonise it, and the leader of the expedition had with him a pilot who had a strange tale to tell of an Englishman named Machin, who had some years before, while trying to escape to France with a lady with whom he had eloped, discovered a further island, for which search was now made, and which was found, or rather re-found, with the cross which Machin had erected on the lady's grave. Prince Henry had the sugar cane and the vine planted there, which soon flourished, and gave Madeira its wide renown. On Porto Santo one of the settlers was Bartholomew Perestrelo, who became the father-in-law of Columbus, and who left to him papers among which were many records of things which helped to inspire the great discoverer with the thoughts of lands beyond the unknown ocean which washed the island's western shores. Still Prince Henry continued to send out new expeditions. His great desire was to pass Cape Bojador, and at last Gil Eannes, disregarding all dangers, ventured far out to sea, and succeeded in doubling the Cape, which had hitherto been the limit of his master's hopes. He found no signs of habitation, but having accomplished this hitherto unattainable achievement, he was

received with high honour on his return. Again adventuring, he succeeded in exploring the coast some fifty more leagues without finding any inhabitants, but traces of people and of camels which were found raised the hopes of the prince, so that he sent another expedition which discovered some 120 leagues from the Cape, the Rio d'Oro, and found some people armed with assegais, with whom, however, they were unable to open any intercourse. Gonsalva, who commanded this expedition, sailed still fifty leagues further, but was not able to do more than find some nets made of bark, which proved the existence of people, though he was unable to enter into any communication with them. The career of discovery was stayed for a season in consequence of foreign wars and intestine troubles, but in 1441 another expedition was sent out, which succeeded in capturing two natives, and on being reinforced by an armed caravel, commanded by Naño Tristram, passed beyond Port Gallée. They took ten natives and a chief prisoners, and explored the coast as far as Cape Bianco, about 21° north latitude. Though the chief was kindly treated on his being taken to Portugal, he was so desirous of freedom that he promised to give as his ransom if taken home again as many as five or six negroes. After a stormy passage the chief was safely landed at Rio d'Oro, and honourably fulfilled his promise, giving not only more negroes, but gold dust and other curiosities. The natives told of merchants trading in gold in those parts, which raised the hopes of the explorers, and induced the prince with even greater anticipations to continue his expeditions, and led to intercourse with the negro states on the Senegal and Gambia. I fear that we must confess that a regular system of slave trading must be ascribed to Prince Henry. The provinces of Alemtejo and Algarves were but thinly peopled, and had never been well cultivated. The importation of negro slaves was welcomed by the possessors of the land, and Prince Henry's plans were consequently favoured by those who did not share his wider views of discovering a pathway to the Indies. Year by year further advances were made and larger expeditions sent, and the tales of the adventurers are full of interest. The islands of the Canaries and the Azores were among the places visited by the explorers, though, strange to say, we have no right to say they were discovered by them, as they are laid down on a Genoese map dated 1351, which is in the Laurentian Library at Florence, and are marked on the Catalan Map of 1439 with the inscription: "These islands were found (not discovered) by Diego de Seville, pilot of the King of Portugal, in 1432." The Canaries were acknowledged to be the possession of the Spaniards, as a Norman, John of Sethencourt, who conquered the inhabitants, did so with the help of the King of Castile, and as his vassal. By a treaty made in 1479, the Portuguese, who had frequently laid claim to the islands, finally ceded them to Spain, in whose possession they still are. The Azores, however, were colonised by Portugal, being first touched by Perestrello in 1431, while Velho Cabral added Santa Maria and Saint Michael and others of the same cluster. It would occupy more space than we can afford to tell of all the separate voyages made by the captains whom Prince Henry sent out. Let me only refer you to the full description of the countries which had been discovered, as well as of some new-found districts added to them by himself and by Pedro de Cintra, which Cadamosto, a Venetian gentleman in the service of Prince Henry, has given us, from which we learn the great advances which were made in the colonies already established, and see the persistent energy with which the one great aim was persisted in. The full materials which had been collected were sent to Venice and entrusted to one of the brethren of the Camaldolese Monastery at Murano, Brother Mauro, under whose guidance a most precious map was produced, which was sent to Portugal in 1459. This map, though it preceded by forty years the rounding of the Cape of Good Hope, clearly lays down a southern extremity of Africa, and marks Sofala and Zanzibar as lying to the north-

east of it. It has an inscription which asserts that in 1420 an Indian junk doubled the Cape from the east, and sailed 2,000 miles beyond it without discovering land. The Doge of Venice writes that he trusts the success of Cadamosto and the map of Mauro may prove an encouragement to Prince Henry, but, unfortunately, that was not to be, for in the next year, 1460, the prince fell ill and died at Sagres. Universally regretted, as he deserved to be, he was buried in the monastery called Santa Maria de Batalha, which his father, King John, had built near Aljubarotta, where he had gained a decisive victory over the Spaniards in 1385. His body was placed in a chapel which King John had erected as the burial-place for himself and his family, in an edifice which may be regarded as the noblest specimen of Christian architecture in the Iberian peninsula. Dr. Mason Neale says of it: "It were worth all the trouble of a trip to Portugal for any one to come to Batalha to revel in the inexhaustible beauty of this superb monument of the taste of bygone days." But among its most precious treasures is the sacred spot where rest the remains of Prince Henry, to whose energy and persevering zeal geography is so deeply indebted. His motto, "*Talent de Bien Faire*," when we remember that in his time "*talent*" conveyed not as to-day the idea of "*power*," of "*faculty*," but of "*desire*," conveys most appropriately the guiding principle of the man whom Englishmen may well be proud of, as having been a scion of their royal house. This influence did not cease with his life. His nephew, King Alfonso V., "*the African*," still pressed on the exploration of the African coast, and in 1471, for the first time, the line was crossed from north to south. Who the bold seaman was that achieved this great feat is not certainly known, but as Cape Lopo Gonsalvez, now Cape Lopez, was the first locality south of the equator to have a geographical name, Major, in his life of Prince Henry, infers that this was the name of the navigator to whom this achievement must be ascribed. In 1484 Diego Cam, a knight of the king's household, earned for himself the honour of discovering a great river, which he named the Rio de Padrao, which the natives called the Zaire, and which is now universally known as the Congo, up which he sailed a short distance, and finding the natives friendly induced some of them to return with him, that, learning Portuguese, they might become interpreters for future travellers. About the same time that Diego Cam returned for the first time from the Congo, another traveller reached Portugal asking for a mission to be sent to the King of Benin to teach the people Christianity. The negro ambassador had a strange tale to tell of a king who lived some 350 leagues east of Benin, named Ogane, who held temporal and spiritual sway over all the neighbouring monarchs, and gave them their investiture, without which they could not rule. This being was never seen by ambassadors. On the days of audience he only showed one of his feet, which was kissed with reverence. The tale of his wealth and power revived the old traditions of Prester John, of whom mediæval legend has so many tales to tell, and the seat of whose monarchy varies from the far East to Abyssinia, and now seemed to spring up again in Central Africa, where he evaded all search as completely as in his more eastern realms. But a more important, though less romantic, achievement fell to the lot of Bartholomew Diaz, who sailed for the south in 1486. After discovering and naming several places along the coast he fell in with severe weather and was driven before the wind due south, out of sight of land, and finding the temperature becoming intensely cold. When the wind abated Diaz, sure that the land must still run north and south, steered in an easterly direction to reach it, but finding none steered north and then at last reached a bay, where he found a number of men herding cows, and hence named the bay Angra dos Vaqueiros. He had rounded the Cape without knowing it. He still continued his course till he reached the Great Fish River, where the discontent of his crew compelled him to return. It was on his way home that he first saw the Cape

which had been so long hidden from mankind, and which he named Cape Tormentoso, the Stormy Cape, but which on his returning to Portugal the king re-named the Cape of Good Hope, as foretelling the realisation of the long-coveted passage to the Indies. It is interesting to note how the family of Diaz had connected themselves with the leading discoveries of Portugal. João Diaz was one of the first to double Cape Bojador, Lorenzo Diaz was the first to reach the Bay of Arguin, while Diniz Diaz was the first to reach Cape Verde. The illness of the king, and other domestic circumstances, prevented any immediate advantage being taken of the discovery of Diaz, and fully ten years were allowed to pass before the new king sent out a fleet to sail round the Cape and find the long-desired route to the Indies. Vasco da Gama started on the 8th of July, 1497, from the Tagus, and on the 22nd of November he passed the Cape of Good Hope. He sailed along the east coast of Africa, reaching the Quillimani River on the 22nd of January, 1498, and Mozambique on the 10th of March. Here again we find traces of Prester John, who, according to the natives, lived far inland, and could only be reached by travelling on camels. Encouraged by this intelligence, as to discover Prester John's country was part of their mission, they still sailed on and reached Mombasa on the 7th of April, and Melinda on the 15th of April. Here they obtained a pilot for Calicut, and sailing thence on the 24th of April, they sighted the high land of India on the 17th of May, anchoring before Calicut on the 20th of that month. The task was accomplished, and Prince Henry's long-formed plan fulfilled. Da Gama was received in Lisbon with great pomp. Before many years had elapsed Portugal had extended her trade to Malacca and China, and wealth and luxury, as well as power, was the natural result of the enterprise which Prince Henry had originated. "It was in Portugal," said Ferdinand Columbus, the son of the great discoverer, "that the admiral began to surmise that if the Portuguese sailed so far south, one might also sail westward and find lands in that direction." Columbus was in Portugal from 1470 to 1484. He made several voyages along the coast of Guinea, and while there married Felipa Moniz, the daughter or niece of Bartholomew Perestrello, the Commander of Porto Santo. I need not repeat the tales we have so often heard and read of sculptured wood, of strange fruit and cane—nay, even of dead bodies, washed ashore on the Azores and Madeira, which folk believed had been driven across from unknown lands by westerly gales, but which we now know must have been brought by the Gulf Stream. A diligent student of all geographical works, Columbus had arrived at the conviction that the world was round, so that if he took a westward course across the sea, he must reach the wealthy shores of which Marco Polo and other travellers told such wondrous tales. His correspondent, Toscanelli, of Florence, sent him a map based on the descriptions of Marco Polo, which has been lately reproduced in Germany, and which showed the islands of Cipango and Antilla not very far from Spain, and revealing behind them the coasts of Asia. There are the traditions, too, that Columbus had sailed north to Iceland, and perhaps in the Heimskringla Saga had learned the legend of the Northmen's discovery of Vinland. In 1480 he laid his plans before the King of Portugal, who is said to have received them with favour, and referred them to a council, who, having obtained from him a full description of his designs, secretly sent out a caravel under pretence of taking supplies to the Azores, but really to explore the western seas. This vessel encountered a storm, and not having the faith and enthusiasm of Columbus, its captain, put back, deriding the whole scheme as visionary in excuse of his cowardice. Disgusted at this treachery, and hopeless of Portuguese support, Columbus determined to leave Portugal and seek support elsewhere, and thus he turned his steps to Spain in 1484 with his son Diego. His adventures there another pen must tell.

COLUMBUS AND GENOA.

By the CHEVALIER FROEHLICH, Italian Consul.

[Addressed to the Members in the Concert Hall, "Old America," at the Royal Botanical Gardens, Old Trafford, Wednesday, July 27th, 1892.]

MR. CHAIRMAN, Ladies and Gentlemen,—It is not so much owing to my personal ability that I have the honour of addressing you this evening, as to the fact that I represent the country in which is situated Genoa, Christopher Columbus's cradle.

Everybody knows something about him. There are indeed very few of the great personages in history who have been more talked about and written about than Christopher Columbus.

Not everybody, however, knows that America is said to have been discovered about a thousand years before Columbus's existence. Nearly fourteen centuries have passed since Hwui Shan pressed on from one unknown land to another, preaching the faith by which his life was guided, and which now sustains and comforts so many millions of worshippers. The Chinese believed his story, but knew nothing more of the land which was visited by him, while European and American scholars have for many years been inclined to discredit it. The fact that the civilised, or partly civilised, nations of America were all found upon or near the Pacific coast indicates that their civilisation was derived from Asia.

The Norwegians also claim for their Viking ancestors the discovery of America. The Norsemen, who are said to have visited Greenland in the sixth century, and the Icelanders who were there, it is stated, in the tenth century claim to have visited America. A few years ago a "Viking" ship (Viking means "Sons of the Fiord"), was unearthed at Sandefjord, in Norway, and may be seen at the museum in Christiania. A fac-simile is now in course of construction, to be towed across the Atlantic for the Chicago Exhibition, to serve as evidence that the Norsemen did discover America. But this is somewhat like saying that 2 and 2 are "6," and proving it by saying that 6 and 6 are 12.

For the most part the subject is shrouded in the midst of obscure narrative and fantastic conjecture. Perhaps Longfellow's well-known poem, "The Skeleton in Armour," may be the best testimony to their presence.

More than a century ago a skeleton was dug up at Fall River, clad in broken and corroded armour; and the idea occurred to the poet of connecting it with the Round Tower at Newport, Rhode Island, generally known as the Old Windmill, though now claimed by the Danes as a work of their early ancestors.

It is not my purpose to weary you with a general discussion of these and some other legends or rumours of pre-Columbian visitors to America. We may admit at once that "there is no good reason why any of them may not have done" what is claimed; but at the same time, the proof that any of them *did* do it is very far from satisfactory. On the contrary, the acknowledged discovery of America in 1492 has its full share of the romantic fascination that belongs to most of the work of the Renaissance period.

It is with the chief actor in the first event that we have to do with just now. What manner of man is this—our Columbus? We possess between thirty and forty distinct portraits. Each is a type. No two of these resemble each other. He is in mail and in silken hose; he is mild and he is fierce; he is freckled like a country lad and he is “bearded like the pard;” he has the bewildered look of one who lacks a compass, and he has the eye through which alone destiny looks.

You and I can draw him as we like. If your Columbus is only a searcher after shining gold, he is a splendid wretch. If your Columbus is only a capturer of harmless heathen, in order that he may chain them to the car of religion, he is a church militant of the worst type. A man is no better than he makes his heroes. The God who *makes* men, and who *uses* men, never intrusted a great purpose to a mean soul. The lonely Genoese, pacing the deck of his caravel, watching for land, and no land from day to day, must have had glimpses of the new hemisphere and visions of its destiny.

Let us look at the condition of Europe—and Italy in particular—after the fourth crusade and the capture and spoliation of Constantinople in 1204, a great epoch in the world's history. Venice was in the ascendant; the four superb bronze horses that still adorn the front of St. Mark's are evidence of Venetian exploits, and the names of Giotto, Dante, Roger Bacon, and many others, are for ever associated with the great fourteenth and fifteenth century Renaissance.

Venice had the lion's share of the commerce though Egypt and Syria with the far East, until in 1261 her great rival Genoa—in alliance with the Greek Emperor, Michael Palaeologus—disputed her supremacy. The hatred between Venice and Genoa grew fiercer than ever. It became a struggle for the mastery of the sea and its commerce, something like that which existed between England and Spain in the days of Drake. Genoa obtained full control of the Black Sea and the Crimea. Acre fell in 1291, and secured her the monopoly of the trade with Central Asia.

The Venetians however, with the Pope's leave—indispensable at that period—made advantageous treaties with the Mahomedans in Egypt and the Red Sea, gained control of the Peloponnesus and the islands in the Ægean and Eastern Mediterranean, and their city during the fourteenth and fifteenth centuries was the most splendid and luxurious in all Christendom.

The Genoese and the Venetians met and quarrelled in Cyprus. Genoa conquered her rival in 1298, and one of the captive Venetians—Marco Polo—whilst in prison in Genoa, communicated to a Frenchman his experiences of travel, which throw so much light on early voyages in the East; and when to-day we look upon those mosaic glass portraits of Marco Polo and Christopher Columbus in the Council Hall of Genoa, we can understand that the former, who had penetrated into the innermost recesses of China (then known as Cathay), aroused that yearning for discovery and adventure which was consummated by the latter.

The Genoese merchants were moved to their very soul with dreams of precious stones, glittering gold, shining silks and aromatic spices. Yet they were wise and prudent in their generation. They did not rush headlong into danger, but rather preferred, as in our present day, that missionaries should go before and pave the way for them. These missionaries were in the habit (our present ones are not so much given that way) of relating their travels with an exceedingly long bow when they returned home; they stretched it to its utmost limit; so, one Oderica da Pordenone tells us how, in 1317, he went to Java, “where the king had a palace of massive gold and silver.”

The Genoese had made vast progress in the art of shipbuilding, and when the third crusade was preached their character as “carriers” for the foreign Christians is

brought out very prominently. The part played by Genoa and Pisa and Venice in the Holy wars is interesting, inasmuch as they, in the humble position of "carriers," were the only Christians who contrived to gain any advantage. Christian and infidel booty was to them alike. The great Bank of St. George, of which I shall speak hereafter, was built of stones brought from a monastery near Constantinople.

Genoa was the Manchester and Liverpool combined. Her galleys, under the emblem of St. George, brought back from distant lands the wealth of India, China, and the East, taking the goods to Spain, England, Flanders, and the North, and returning with cargoes of merchandise.

Genoese families established commercial houses in London, and built warehouses along the Thames. Genoa, Venice, and Florence were the first trading communities which in the 12th century appointed consuls resident in London.

Not until 1485, under Richard III., did England appoint a consul in the person of Laurentio Strozzi in Florence, a man well known to visitors to the city of all flowers and the flower of all cities. Genoese merchants sold galleys and war material to Robert Bruce against Edward II. In 1347 Edward III. hired Genoese galleys and borrowed Florentine millions (which, by the way, have never been restored) for his wars.

In addition to their teaching in commercial enterprises, Chaucer, our earliest poet, had in Liguria the advantage of Petrarch's society, who had a special liking for Englishmen. Horatio Pallavicini, of the great Genoese family, came to England with a letter of recommendation to Queen Mary, who made him the collector of the Papal taxes, and being a thrifty Genoese, he pocketed the same, and so gained a position which enabled him to lend large sums of money at a high rate of interest to Queen Elizabeth. His widow married the "Protector's" grandfather, and three young Pallavicinis fell in love with three young Cromwells, and the great Oliver was blessed with two Genoese uncles and one Genoese aunt. No wonder he had a great affection for the Ligurian Republic.

I ought to have mentioned before that Richard Cœur de Lion embarked on Genoese galleys under their banner of the Red Cross and the flag of St. George, which he brought home to become the patron of Old England, and to this day the Saint and the Dragon on the coin of the realm are your best friends, and I trust your purses may always be well stocked with them.

The Conquest of Constantinople by the Turks in 1454, and the loss to Genoa of her Black Sea provinces, made her anxious for new fields. About that time it was that Christopher, son of Domenico Columbus, a wool stapler by trade, was born. Historians differ as to the exact year, but it must have been between 1446 and 1451, if we may take as a guide an authentic document, namely, a notarial declaration, dated the 30th October, 1470, of Christopher's coming of age, at that period of history, according to Roman law, at nineteen, according to Genoese at twenty-five. In the same year, 1470, his father removed to Savona, now about two hours by rail from Genoa; hence Savona, like Cogoletto and Calvi (Corsica), disputes the honour of having produced the great navigator. We frequently find that many extraordinary men in the world's history, by some still unexplained, most mysterious freak of nature, were born in two, three, or more places.

Seven wealthy towns contend for Homer, dead,
Through which the living Homer begged his bread.

But there are again authentic documents amongst the archives in the "Palazetto" (Town Hall), proving that in our case Genoa was *the* place. There is his autograph will, entreating his heirs to labour "for the honour and welfare of Genoa, and to do

their utmost to maintain the position and increase the prosperity of the Republic." His affection for his native soil, in the midst of all his trials and disappointments, never left him, and showed itself most conspicuously in 1501, when, after his three memorable voyages, still comparatively poor and unbefriended, he devised the means of leaving a durable record to his own dear Genoa, conferring on the subject with Nicolo Oderigo, the Genoese Ambassador, specially sent to the court of Ferdinand and Isabella to determine about the extinction of the pirates from Catalonia and Majorca, who used to prey on Genoese commerce.

Columbus proposed to assign "in perpetuum" the tenth part of his income by rights, properties, and privileges, appertaining and derived from the New World, to be applied towards the reduction of dues and taxes charged upon articles of consumption in Genoa, and Oderigo and Columbus (his letter is dated the 27th December, 1504) agreed upon appointing the great Bank of St. George residuary legatee and executrix.

I leave the Bank for a few moments—and of this my lady hearers will approve—to touch upon a cheerful feature in Columbus's life.

Woman's benign influence has often been manifest in the world's past history, and is so in our present days, in the shaping and influencing the course and aim of man, and so it was in Columbus's time. During his disappointments in Portugal, it was Donna Filippa Perestrelo who comforted and sympathised with him, encouraging him to persevere. Then again, when at the great Council of Salamanca, he was almost sneered at and his ideas treated like those of a visionary, totally unsustainable in reason, it was the beautiful Beatrice Enriquez who kept up his moral courage. Once more he found an influential friend in the Marchioness of Bobadilla at the Spanish Court, and still another, the fascinating Donna Giovanna Della Torre, came to his assistance and support with all the persuasiveness, an intelligent woman is capable of displaying. Last but not least, the most shining figure after Columbus himself in the history of the discovery of America is Isabella the Catholic, who went the length of offering to dispose of her own jewels, to defray the expenses of fitting out Columbus's little fleet.

From the jewels back to the Bank of St. George is but one step. To define exactly its origin is difficult. The Genoese, in order to arm a fleet, adopted the plan of selling a portion of the public revenues, be it the tax on salt or some other commodity, to capitalists who would advance money, and they were called "monisti" (moneyed men), or in the Genoese dialect "mahone." The crusades gave the idea of advancing loans to the Government on the security, as I have said, of the taxes and public revenues, and the first formal negotiations took place in 1148. As time went on, the credit and interest of the Bank grew apace. Hospitals, churches, and confraternities, all placed their capital in it; no anxiety was ever felt by any shareholder until the days of the French Revolution. The Bank had its own laws, magistrates, and independent authority—a state within a state—a republic within a republic—with the right of passing judicial sentences without appeal—in fact, all the prerogatives of self government. It would only issue paper for the coin in its actual possession; it was not a Bank for borrowers in the ordinary sense, but for capitalists, who required enormous security for immense sums until they could employ them themselves. One of the most interesting features in connection with the dealings of the Bank with the Genoese Government, was the cession from time to time of various colonies and provinces—Corsica, the Black Sea (Caffa, Sebastopol, Balaclava, Soudak), Famagosta in Cyprus, and territories on the Ligurian coast—to the directors of the Bank, like in later history, the cession of our East India Colonies to the East India Company. After centuries of power, wealth, and influence, the Austrian invasion,

and subsequently the French Revolution of 1789, brought about the ruin of the famous Bank.

The venerable old Gothic palace of St. George, dating from 1260—the cradle of modern commerce, modern banking schemes, and modern wealth—as it stands in Genoa and a view of which will be shown, still testifies to its bygone glory; and though the Government intended to pull it down, to make room for a handsome modern street, the Genoese have stuck to this relic of their former wealth. The walls of the entrance hall, the inner court yard, and the Council chamber are lined with statues of worthy men, magnanimous citizens, thirty-five benefactors to their country. A stone tablet underneath each relates their many virtues and their liberality. One of these worthies had founded a hospital; another had bought off a tax on provisions, which pressed heavily on the poor; another had left shares in the Bank to provide a dower for poor maidens; another had left his whole fortune to improve the Port and so on.

The most substantial benefit conferred by the Bank of St. George was the erection and establishment in 1595 of the buildings of the Porto Franco, 350 bonded warehouses with gates towards the city and the sea, where all merchandise from abroad was gratuitously admitted, and thence sent by sea or land without tax or duty of any kind, thus obviating the payment of “a tenth of the sea,” as it was called, to the Archbishop, and to avoid which, many vessels used to anchor in neighbouring ports, and unship their cargoes elsewhere.

He who would form some idea of the cradle of Genoa's bygone greatness, must wander through the dusky, narrow streets of the old city, lined with marble palaces, where the rich merchants coined and lavished their earlier gains. An English traveller in the seventeenth century says that “Genoa to him looked like a proud young lady, in a straight-bodied flowered gown, which makes her look tall indeed and fine, but hinders her from being at her ease and taking breath freely.”

The Cathedral of San Lorenzo of which you will see a fine view, is perhaps the most striking building in Genoa; built in courses of black and white marble, covered with carvings and images all blended together in one harmonious whole, by the mellowing hand of time. The façade of this cathedral presents a perfect museum of architecture, pure Italian Gothic, Moorish, and Byzantine.

Some Genoese family names are no doubt well known to you, such as the Fieschi, the Doria, Spinola, Grimaldi, Durazzo, Pallavicini, and many others, whose descendants are to this day ornaments in Genoese society and elsewhere.

It must be noted that in giving birth to Christopher Columbus—supposing no one else would have discovered America—Genoa entered upon her decline, slowly but steadily, and as time went on after Columbus had set foot in America, commerce, and with it the flow of prosperity, took other directions.

Leaving untouched her history of the last three centuries, ending with her conquest by Napoleon I., the congress of Vienna in 1814 enrolled Genoa amongst the domains of the House of Savoy, and now there is no city in Italy more loyal, nor one that gives a heartier welcome to King Humbert and Queen Margherita, the king and queen—after a thousand years of struggle—of a united Italy, than the once haughty Ligurian Republic. Life and vitality have within the last half century wonderfully sprung up afresh; her commerce flourishes and she disputes with Marseilles the peaceful preponderance of the Mediterranean.

Her citizens are large-hearted and public spirited as of old. Only a few years ago the Duke of Galliera left £800,000 for harbour improvements, to which the wealthy corporation added an equal sum for the works now in progress and approaching completion.

Mazzini was born there, and his remains rest in her magnificent Campo Santo, the cemetery, of which I shall directly show you a fine series of views.

At Genoa, in 1854, a British fleet embarked the Italian (then still Sardinian) Army, which fought by your side gallantly in the Crimea.

From Genoa in 1860 Garibaldi started on his momentous expedition to Sicily, and when within sight of the coast, was chased by King Bomba's cruisers, and would surely have been sunk but for a British Admiral whose ships "by mistake" got between the two parties. Italians gratefully remember this little incident.

Genoa, which in the advance and progress of United Italy has had a very active part, evinces a decided leaning towards England, who more than any other European country, sympathized with Italy in her struggle for independence and unity; hence no visitors are more welcome in Italy than Englishmen and Englishwomen.

Picturesque, bustling Genoa, where every house is a palace, holds its own with its majestic neighbours, the maritime Alps and the Mediterranean; Genoa's "face is its fortune"—hence she is appropriately called "*Genova la Superba*" (the proud).

The Columbian fêtes are now in full progress at Genoa; a National Exhibition was opened a few weeks ago which, if no match in size for the London and Paris ones, in other respects—for instance, tasteful arrangement, historical collections, art treasures, &c.—has undoubted attractions for visitors. An International naval fleet from all the great powers will assemble in September, in the spacious harbour of Genoa. An International Geographical Congress will be held from the 18th to the 25th September. Cordial invitations from the Marquis of Doria, the lineal descendant of the old Dorias, President of the Italian Geographical Society, and the Municipality of Genoa, have been received by our Society, assuring visitors of a hearty welcome. Arrangements for reduced fares are being made, and I hope many of you will avail yourselves of such an opportunity.

The address was followed by the exhibition of a large number of lantern-slides, each view being fully explained by the lecturer: (1) Map, District of Genoa; (2) Map, District of Genoa, 1841; (3) Map, Port of Genoa, 1892; (4) General View of Genoa; (5) Special View of Genoa from Railway Station; (6) Old Gateway in Genoa; (7) Cathedral of San Lorenzo; (8) Cathedral—principal Doorway; (9) Doorway in Piazza San Matteo, where Andrea Doria harangued his countrymen when he seized the Government in 1528; (10) House in which Christopher Columbus was born; (11) Via Balbi; (12) Bank of Saint George; (13) Bank of Saint George—Statues; (14) Bank of Saint George—Seal; (15) Doria Palace—(here breathed his last the great Admiral Andrea Doria, November 25th, 1560, a few days before reaching his 94th year); (16) Doria Villa Gardens; (17) Genoa, from Doria Villa Gardens; (18) Harbour View; (19) Raggio Castle; (20) Ducal Palace; (21) Room in Municipal Palace, dedicated to the Duchess Di Galliera; (22) The Columbus Monument. The idea was started by King Carlo Ulberto, of Sardinia, grandfather of King Umberto, of Italy, who himself subscribed towards it £2,000 sterling. The foundation stone was laid on September 27th, 1846; the monument was unveiled in September, 1862, by King Victor Emmanuel. (23-26) The Four Bas-reliefs; (27) The Crown of Bronze recently deposited on Monument; (28) Columbus's Letter to the Bank of St. George (27th December, 1504); (29) Columbus's Letter—apocryphal; (30) Campo Santo—general view; (31-34) Campo Santo—The Four Galleries; (35-44) Campo Santo—Ten Statuary Groups; (45) Savona—Corso Principe Amadeo, and others.



M. FRENCH-SHELDON. BÉBÉ BWANA.

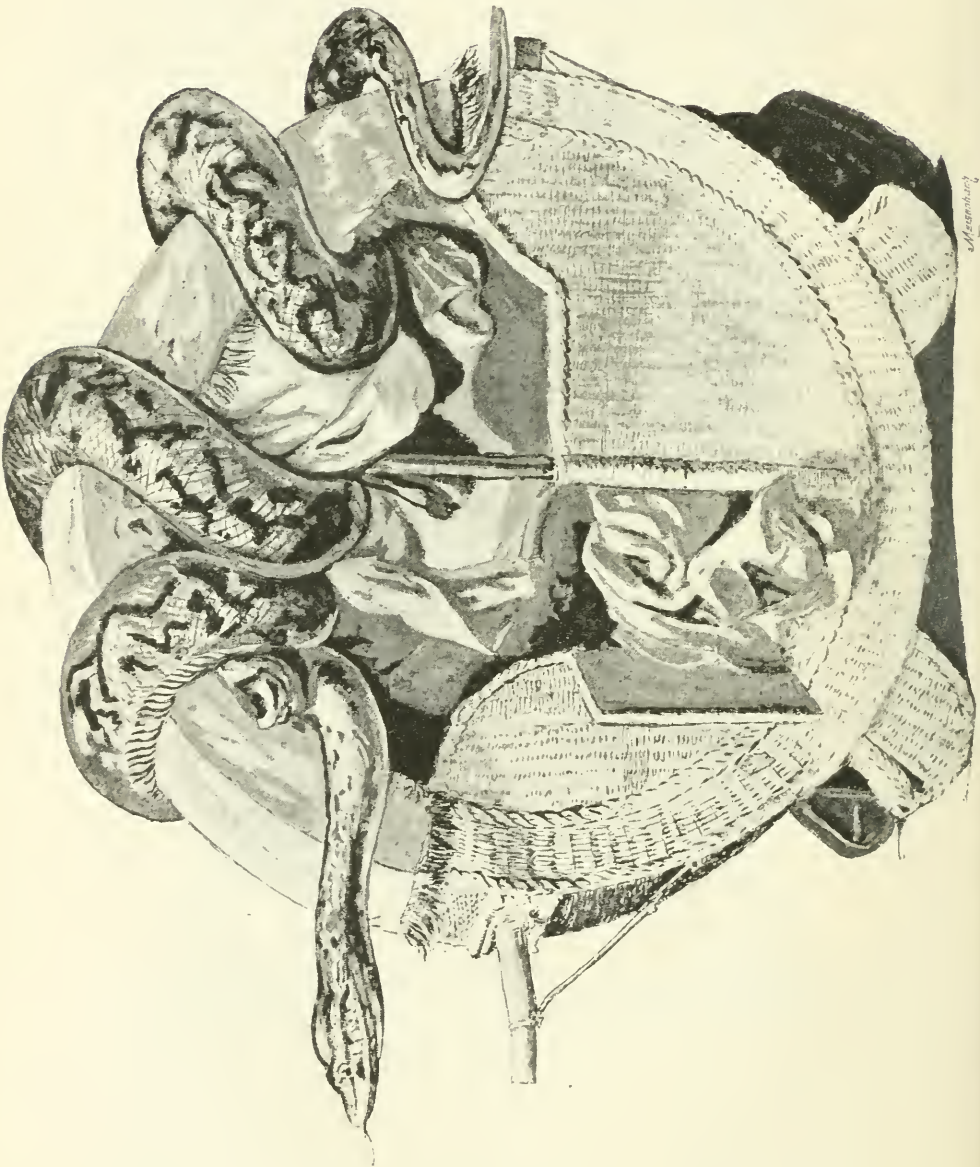
REVIEWS.

SULTAN TO SULTAN. Adventures among the Masai and other Tribes of East Africa. By M. FRENCH-SHELDON ("Bébé Bwana"). Small 4to, 436pp. Map, large number of illustrations, and portraits of the authoress and others. *London: Saxon and Co., 1892.* Price 21s.



SOMALI QUEEN.

THIS most interesting volume is the record of the remarkable dash made by Mrs. French-Sheldon into East Central Africa. The record is remarkable for the very valuable insight thrown upon the customs of the natives. The intention of the traveller was probably to make a special study of the matters relating to women, and their conditions amongst these savage tribes, and some amount of information is given. But it is evident that Mrs. French-Sheldon could have given a great deal more if it had been prudent to do so. We have a fair account of the ground covered in the journey by other travellers, but she has been with the first to navigate Lake Chala, and she has added to the now lengthening list of women travellers who have



PALANQUIN AND PYTHON.

ventured far afield. The illustrations add very much to the value of the record. The arms and ornaments, utensils and natural products, are profusely illustrated, and for a long time to come we shall hardly expect to have a more complete illustration of them. Mrs. French-Sheldon was not without some adventures, some rather amusing, and some which might have ended tragically. Our old friend Mandara comes out, and his likeness is given with the rascality we have associated with him through the accounts of other travellers, although Mrs. French-Sheldon seems to have somehow awed him. It is difficult to select passages for illustration, but her night adventure with a snake is well told :—

“THE PYTHON.

“One night, experiencing great fatigue, I fell into a profound slumber, lying in my palanquin within my tent, when suddenly I awoke with a shuddering apprehension



MASAI WARRIOR.

of danger, and possessed by an instinctive feeling of the presence of some harmful thing. Involuntary seizing my knife and pistol, I cried out, ‘Who is there?’ No answer. Then I called out for the *askari* on guard, at the same time tried to penetrate the darkness surrounding me, when I became aware, through the atmospheric conditions, that a cold, clammy, moving object was above me, in truth, almost touching me, on the top of my palanquin, the rattans of which were cracking as if under the pressure of a mangle. I was struggling to slide out of the palanquin without rising from my recumbent position to avoid touching the thing, when the alarmed *askari* entered, carrying a lantern, to my abject horror revealing to me the object I had intuitively dreaded. My blood fairly seemed to congeal in my veins at the spectacle : it was an enormous python, about 15 feet long, which had coiled round the top

of the palanquin, and at that moment was ramping and thrusting its head out, searching for some attainable projection around which to coil its great, shiny, loathsome length of body. Seeing the python, the *askari* immediately yelled wildly out for help, and in a moment a dozen stalwart porters pitched in in a merciless way with their knives upon the reptile, slashing and cutting its writhing body into inch bits. I am not ashamed to confess it was the supreme fear of my life, and almost paralysed me. I came very near collapsing and relinquishing myself to the nervous shock ; but



THE SULTAN OF ZANZIBAR.

there was no time for such an indulgence of weakness ; there were other sequences to be considered. However, during my *safari* in East Africa I only saw one other live python, wrestling inconsequently with all its might with one of the invincible dead giants of the forest, without any visible success, as the majestic, unyielding tree gave no evidence of weakness under the pressing coils of the maddened monster, which was being overtaken with the realisation that all was futile, and in the end it must be thwarted and admit defeat."

The descent to Lake Chala is also most interesting :—

“LAKE CHALA.

“Through gaps in the massed trees, through which the sun could scarcely filter, the arboreal darkness was pierced by a radiant gleam of light, and the flashing lake greeted my expectant eyes. There arose a general shout from the men, ‘Chala! Chala!’ and, behold! I found myself rewarded by being upon a rugged, rough tangle of prostrate trees and wild tumble of white and grey rocks, whilst the limpid, restless waters were laughing and dashing themselves into a jubilant foam at my feet.



LAKE CHALA (SOUTH-WESTERN VIEW).

The scene was one of which I became enamoured. It was truly overcast with a sublime sense of a holy sanctuary. Losing myself in the spectacle, I forgot Mr. A. and porters, with the two sections of pontoons we had taken the precaution to bring, were waiting eagerly for me to give the signal agreed upon when once I should be safe at the bottom on the lake shore. After a moment's revery, recovering myself, I sounded the whistle. Then the deafening crash and yell and rush commenced, as the porters struggled valorously with their precious burden down the narrow, serpentine, rugged figment of a path, which we in the van had essayed to make. The marvellous ingenuity with which these porters manœuvred their metal loads, and the stoical way, when they would slip, and their burden fall upon their shoulders and cruelly dig out chunks

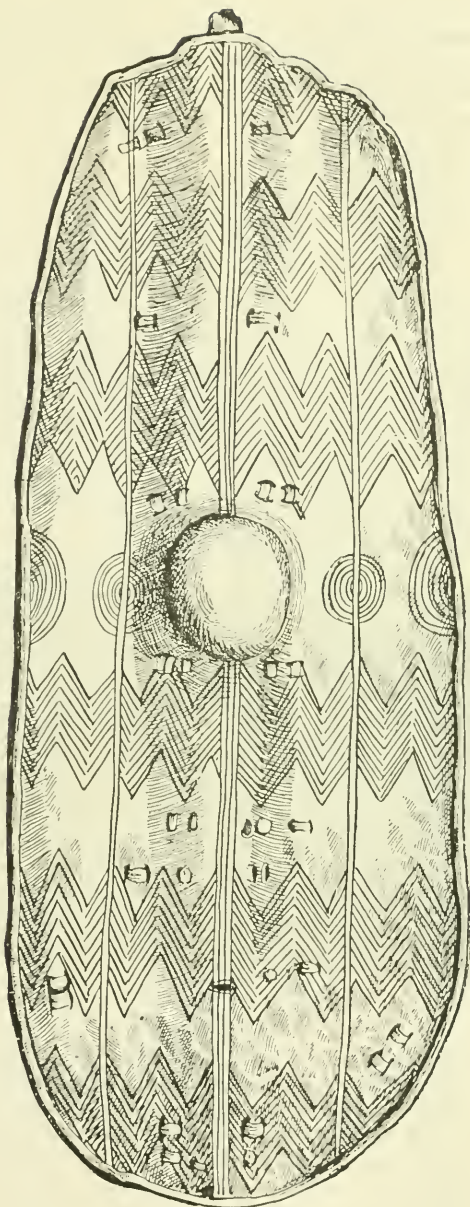
of flesh, the blood trickling from their wounds, they would struggle to their feet and go on without complaint, called forth from their comrades screams of applause; whilst the leaders sung a wild, weird strain full of rythm, just as we find men who are moving heavy loads always instinctively do in order to keep time with each other's movements. Finally the two copper sections of the pontoon were in the water. They were immediately examined to see if there had been any puncture made through the thin metal sides in their difficult transit. They were scarcely large enough, when lashed together and covered with a *m'whala* door, which had been converted into a platform, to hold myself and men, and presented to the onlooker a most unsafe maritime structure. The moment came to embark, and on demanding 'Where are the men who are to accompany us?' not one would respond for the first excursion.



LAKE JIPO.

Subsequently, Josefe and a headman were perfectly willing, if not eager, to distinguish themselves by going. Presently they murmured among themselves, 'No, no; we will not go on devil's water. Just see the crocodiles, and hear the monkeys, and look at the breath of the devil! *Inshalla* (God willing), we will remain with our feet under us on shore,' as they pointed to the water which was in some considerable commotion, revealing here and there its amphibious denizens. After going through the usual process of calling them goats, and cowards, and jungle-men, my interpreter, Josefe, who was somewhat of a dare-devil, and ready for an adventure, stepped forward, saluted me, and said quite gallantly, 'Bébé Bwana, at your service.' So Mr. A., Josefe, and myself, with our guns and photographic instruments, embarked upon the bobbing pontoon with two long improvised paddles. We pushed carefully out from the shore, amid the shouts of the bewildered porters, who eagerly watched the

performance, fully persuaded in their own minds that it must end disastrously, having taken the precaution to attach a hawser several hundred feet in length to the uncouth craft in case of accident. The crocodiles were very curious, not knowing what to make of the invasion of their haunt, and came in close proximity to our underpinnings, as with one paddle I manœuvred to guide the craft and Josefe awkwardly propelled with the other, whilst my guest kept a sharp look-out for the obtrusive aquatic creatures. After moving the length of the hawser we found the craft was manageable, and cut loose, to the horror of the men grouped on the rocks. At every turn there arose from the midst of the water forest great flocks of birds, which had all the appearance of being ducks, but which have since been named by the late Mr. Bates *Phalacrocorax Africanus* and *P. carbo*, a species of cormorant, but edible. They cawed and screamed and whirled about, making a great commotion, and, upon our approach, would dive into the water, when the crocodiles would immediately give them chase, which was obvious on account of the extreme limpidness of the lake. I was enabled to bring back several specimens, shot from my craft on the lake, as well as a specimen of monkey which has as yet not been named. Gazing up at the steep



ROMBO SHIELD.

cliffs on all sides, the vines hanging in theatrical festoons, and the weird, weird beauty of the various foliage contrasting with the grand trunks of whited trees, the strange murmur of the waters, the remarkable outbreak of waves crested with foam, the small

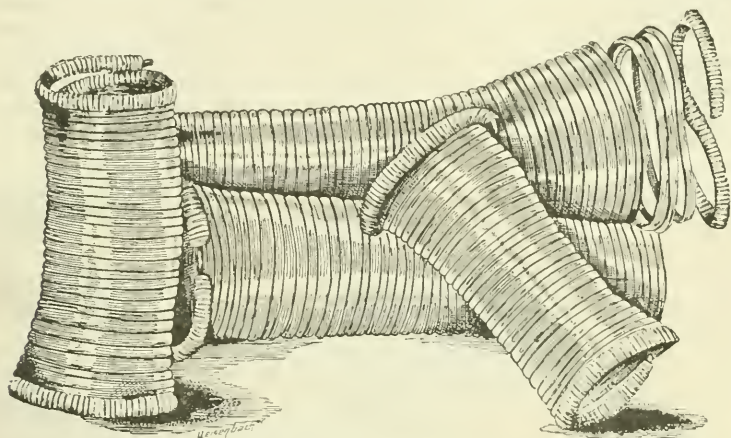
circle of sky as I looked up, and the mad tumble of rocks, all contributed to make it seem as if I was in some phantom land. Everything was most eldritch and immense. At the firing of a gun the reverberations came back like a thunder-clap—sharp, crashing. I should not have been surprised to have seen the whole lake covered with some uncanny creatures, or to have seen the apparition of some mammoth forest king issue forth and assert himself as monarch of all we surveyed, and crush us out of existence as invaders. The hours spent upon this lake at different times held me in a thralldom of wonder. There was little said, very much thought, and imagination thrilled my brain with the ineffable pleasure which I had craved and sought for years, of being the first to visit a place undefiled by the presence of man before. The thing which



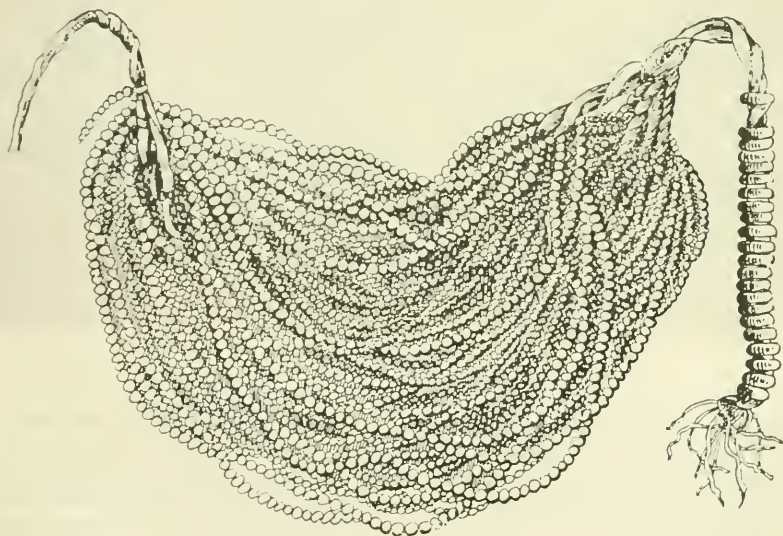
WHITE IVORY.

surprised me most was the fact that when I plunged my paddle two or three feet under the water at various points the suction was so great it would be drawn away from me, and only with difficulty could I recover it and resume control; and at other points it would be drawn beneath the float, and again I would have to tug lustily to pull it back. At the same time the entire lake was in agitation—it was bubbling almost like a hot spring—and yet there was no rift in the rim of the crest through which currents of wind could sweep down and cause this commotion. After trying to make a sounding with the plummet and line of 250ft. without success, I determined that it was the reservoir for the meltings of the snow from Kilimanjaro, and that these under-currents and counter-currents were due to subterranean intakes and outlets, and that this body of water fed the streams of the plains and was a watershed

subsidiary to Kibo and Mawenzi. Another remarkable thing—although the dashing of the water at different times must have reached a greater height than its level when I was afloat thereon, as shown by the moisture upon the boundary rocks, they were unstained by decayed vegetation and uncoloured by mineral deposit. It was perfectly



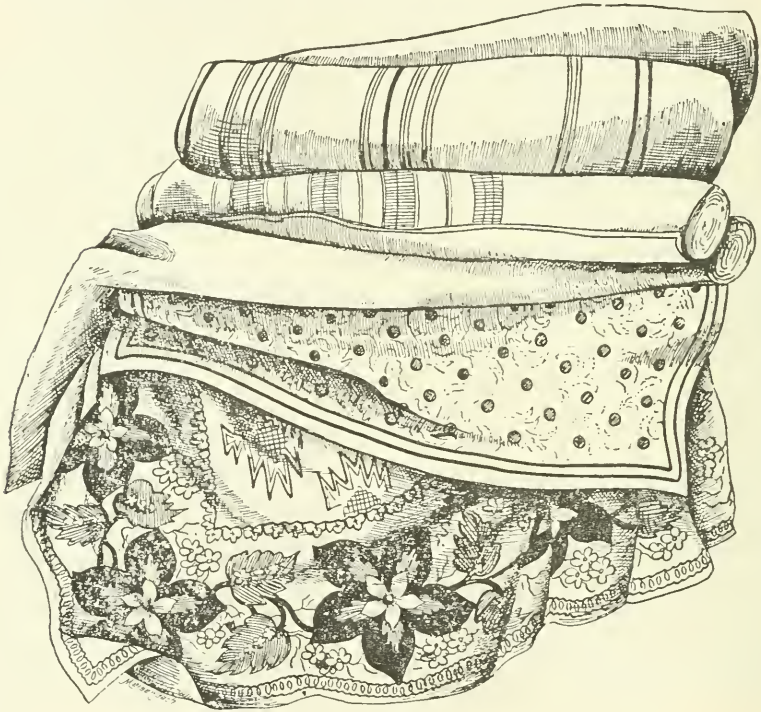
MASAI WOMAN'S ORNAMENTS. IRON COILS FINISHED WITH BRASS AND COPPER.



WA-TEITA NECKLACE.

clear and clean, as evidenced by the specimens of rock I took the pains to bring home for analysis. The water to the taste was not disagreeable, but was soft and sweet, a trifle warm, 72°, whereas the atmospheric mean temperature was 74°. As we cast about the margin of this lake, with its seductive little insets making unrevealed bays,

until one was fairly upon the turn of the margin, it was so exquisite and beautiful ! And as far as the water scene and the surrounding forest of vegetation, I could scarcely believe it possible such beauty could be encompassed within the precincts of the crater lake, nor have I ever heard of a parallel crater. Although this is doubtless one of the last evidences of a volcanic eruption in this region, it has survived the memory of the people. The fabulous tradition concerning it is that when the sun sank into the mouth of the Mawenzi, the Masai village which was located upon the site of the lake when Chala was a mountain was tossed into the air, and great rush of water rose filling up the space and making the present lake, and had swallowed the people ; and that the strange murmur, which is almost unaccountable, is caused by the spirits of



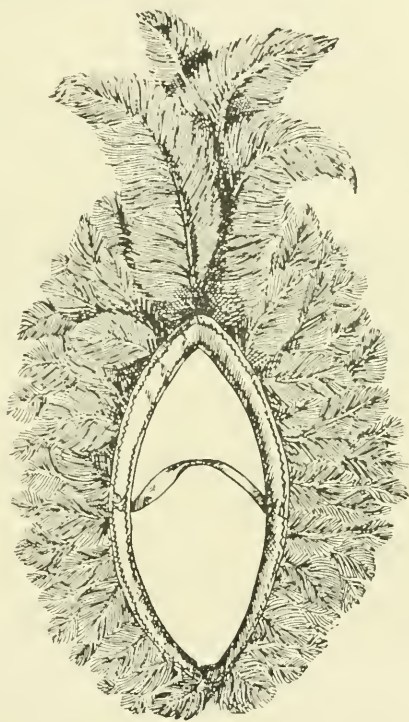
TRADE CLOTHS.

those unhappy wretches ; the southing of the trees is the lowing of the cattle and the bleating of the sheep and the clapping of the reeds is the cackling of the fowl. Another version of this tradition is that the people of the Masai village that was once located here and had committed so many depredations against other tribes, became arrogant and ungrateful, and refused to pay tribute for years to Kibo and Mawenzi ; so the angry god of the mountains inundated their village, and swept them far away out of existence.

What length of far-famed ages billowed high
With human agitation roll along
In unsubstantial images of air !

Captain Sir John C. Willoughby says : ' Making a slight detour, by climbing the lower slopes of Kilimanjaro, which enabled us to visit the curious Lake Cala [Chala], no

sooner had we ascended the low hills encircling its eastern shore than we were rewarded by a glorious view. At least a thousand feet below us nestled the lovely lake, somewhat triangular in shape, and from one to two and a half miles in its widest diameter, completely embedded among hills and cliffs—a basin in which the great Masai mountain god could always wash his hands. From our position its shores appeared inaccessible, but the natives declared a descent was practicable.' Notwithstanding this statement, I was not enabled to find that any of my porters had heard of any one descending to the surface of the lake, or to meet any native who had gone to the water's edge, or who could be induced to descend thereto; and, instead of being the subject of curiosity, which I had apprehended and was desirous to avoid, when the natives knew I intended to descend, and witnessed my preparations, they flew back, terror-stricken, into their mountain villages, and not one intrusive eye



OSTRICH FEATHER MASAI MASK.

would gaze on the white woman on the devil's water. Bewitched by Lake Chala, I made several descents at different times, and floated my little American flag from the pontoon craft during its circumnavigation. To facilitate matters at some future day, when I hoped to return, the historic little craft named for me was buried in a bed of leaves, and I retained a key describing its secret hiding-place. Several slabs loom up at various intersections of the lake margin, defiled by red paint, which emblazon my name and the date of this exploit. Having completed for the time-being my explorations of Lake Chala, I turned my attention to the people who inhabit that section of Africa."

Mrs. Mary French-Sheldon takes her readers pleasantly along the voyage from London, through Italy, the Suez Canal, the Red Sea, to Aden ; from Aden to Mombasa. The view of Aden is very striking ; and the picture of the fort built by Vasco da Gama at Mombasa is also given. From Mombasa to Zanzibar, where, forming her caravan, she goes back to the mainland and makes her start for the interior. Through Duruma and Teita, and Taveta to Lake Chala ; then examining the extinct volcanoes at Chaga, she enters the Masai country and finds the generous Mireali at Marengu, interviews Fumbo and Mandara at Moschi ; and, returning through German territory, meets with an accident, which might have been fatal, and thence home. In an appendix she gives a list of medical and surgical appliances taken by her which will, no doubt, be useful to other ladies taking the same journey. We like dogs. One of the most pathetic incidents of Mr. Stanley's journey is the death of his little dog at Fort Bodo of grief at the absence of his master ; and Mrs. French-Sheldon's last word is the portrait of a noble collie who, although he had not accompanied her in the journey, was one to welcome her home, and whom she has named "Jaques Sheldon."

[The fourteen illustrations to this notice are from the book, and have been kindly lent by Messrs. Saxon and Co. They are as follows : Mrs. French-Sheldon ("Bébé Bwana") in Travelling Costume ; Two Native Water-Carriers Joined by Rubber Plant ; Somali Queen ; The Sultan of Zanzibar ; White Ivory ("Black" Ivory means Slaves) ; Trade Cloths ; Wa-Teita Necklace ; Lake Jipo ; Lake Chala (South-Western View) ; Rombo Shield ; Masai Woman's Ornaments (Iron Coils Finished with Brass and Copper) ; Masai Ostrich Feather Mask ; Masai Warrior, "Wow !" ; Palanquin and Python. There are 25 full-page illustrations and a page map of the district (drawn by the Victorians of the Manchester Geographical Society), and about 120 illustrations in the text, and a portrait of Mrs. French-Sheldon as a frontispiece. It is a sumptuous book.]

THE PARTITION OF AFRICA. By J. Scott Keltie, Assistant Secretary to the Royal Geographical Society. Maps. London : E. Stamford, 1893. Price, 16s.

THIS work is produced in the author's able and well-known style, and well supplies a quite recently-developed want. The attention paid by Europe to the "last of the continents" has been so close of late, and the developments so rapid, that it has become difficult even for experts to follow the remarkable changes which have taken place. For the average man to keep in view the various international relationships and responsibilities which have grown up in the "Dark Continent" has become well-nigh impossible. At such a juncture this work from the able pen of the Assistant Secretary of the Royal Geographical Society is not only welcome but truly valuable.

In the opening chapter the author sketches briefly the dealings of the Ancients with the African continent. The civilization developed, first by the Egyptians, afterwards by the Greeks, and later by the Romans, in the Nile valley ; the bold explorations and resulting discoveries of the Phœnicians on the Mediterranean and Atlantic coasts ; and the colonial achievements of the Carthaginians are each in turn touched upon ; while the geographical and chartographical work of Hecataeus, Herodotus, Eratosthenes, and Ptolemy receives due attention.

A later chapter deals with the Islamic invasion in the seventh century, which not only "swept Europe entirely out of the continent" but resulted in the peopling of

the North African coast-lands with Arabs, and in the establishment of Arab settlements well down the East Coast to, at least, as far as the Zambezi. The spread of Arab influence led to the growth of a "certain amount of civilization" and the development of commerce, the introduction of the camel from Asia having a great influence on the latter by making the cross-desert trade possible. Travelling traders, pilgrims going to and returning from Mecca, and other wanderers collected much geographical information. This, in conjunction with the learning which was encouraged, produced the Arabian school of geographers—Leo Africanus, Abulfeda, Edrisi, and others.

Dealing with the work of the Portuguese in the "Dark Continent," Mr. Keltie points out that "the modern exploration and partition of Africa" dates from the Portuguese siege of Ceuta, on the Morocco coast, in 1415. The desire of Portugal to open up direct sea communication with India led to the despatch of vessel after vessel under such navigators as Cadamosto, Diego Cam, Bartholomew Diaz, and Vasco da Gama. Each succeeding expedition pushed further and further down the West Coast until Diaz rounded the Cape, and at last, in 1497, Vasco da Gama reached India itself. These exploratory voyages were set on foot by Prince Henry, one of the younger sons of King John of Portugal, who by his enterprise earned for himself the title of "Navigator." It is interesting to remember that Queen Philippa, the mother of Prince Henry, was the daughter of the English prince, John of Gaunt, Duke of Lancaster.

The exploration of the coasts of Africa, of course, led to not only the discovery of a sea passage to India, but also to the foundation of the Portuguese African colonies on both the East and West coasts. The discovery of America in 1492, and the subsequent growth of interest in the West, turned the attention of Europe away from Africa, so far as the development of its natural resources was concerned. On the other hand the necessity of imported labour to develop the products of the New World led to the foundation of the West Coast African slave-trade.

The middle of the 16th century found England in the African field for the first time, Captain Windham voyaging "for the trade of Barbary," and Mr. Keltie points out (again quoting Windham) that "the Portuguese were much offended with this new trade into Barbary; and . . . gave out in England, through the merchants, that if they took us in these parts they would use us as their mortal enemies." Mr. Keltie adds: "How are the mighty fallen!" Other voyages were undertaken, in due time the Gold Coast was reached, and in 1652 England, also, began the slave-trade under Sir John Hawkins. France, some time before, had commenced trading to both the Gambia and the Senegal, while towards the end of the century (1595) Holland also entered the field. The Dutch rapidly gained influence along the West Coast, and in 1652 established themselves at the Cape.

The beginning of the 18th century found all the before-mentioned powers in possession of portions of both the East and West coasts. During the various wars which raged from 1700 to 1815 many of these possessions changed hands more than once, the Cape becoming English in 1795. At the end of the 18th century the British slave-trade was falling rapidly into ill-repute, and early in the 19th (1807) became illegal for British subjects.

At this time Turkey was all-powerful in North Africa. The Arabs from Muscat had supplanted the Portuguese to a large extent on the East Coast, becoming supreme at Zanzibar and on the neighbouring coasts of the main-land, and gradually extending their influence inland even to the Great Lakes. The Portuguese had been compelled to confine their attentions to Mozambique on the East Coast; they also held the Angola territory on the West, but had no influence in, or even knowledge, much less

possession of, the interior districts between. France continued active in the Gambia district and in parts of the Niger basin, and later Algeria fell into her hands. England had founded a colony of freed slaves at Sierra Leone, and subsequently established herself at Lagos and the Gold Coast, and extended her influence in South Africa northward to the Orange River. With the exception of the extension of Egyptian influence in the Soudan along the Nile valley to Khartoum and Gondokoro, which culminated later in the founding of Equatoria, few further changes took place till quite recently.

Until the middle of the present century little had been done towards the exploration of the central portions of the continent. Towards the end of last century researches in the Niger district had been taken in hand by various travellers, notably by Mungo Park, and were followed up in the beginning of the 19th by Denham and Clapperton, and consummated later by Richard Lander following the Niger to the sea. Captain Tuckey had made an abortive attempt to explore the Congo, and several missionaries and travellers, early in the century, penetrated considerably to the north of the Orange River from South Africa. Dr. Lacerda had previously travelled from Tete on the Zambezi to Kazembe's, but did not live to return. The interior of the continent remained, therefore, a complete blank, and, indeed, appeared as such in the maps published at least so late as 1850.

The explorations and enquiries of Dr. Krapf, and of Messrs. Erhardt and Rebmann, in the early fifties, resulted in the production of the Mombas mission map. This, as is well known, led to the expedition of Burton and Speke, in 1857, which first made known the existence of Lakes Tanganyika and Victoria. Livingstone, meanwhile, had discovered Lake Ngami, and had followed the Zambezi to its source when making his way from the Cape to the Portuguese city of St. Paul de Loanda in 1853; and, on again turning his face inland, crossed the continent from west to east. Later, as is well known, on his Zambezi expedition he succeeded in discovering Lakes Nyassa and Shirwa; and on his last great journey reached, for the first time, the south end of Lake Tanganyika, made known Lakes Bangweolo and Moero, and discovered, in the Lualaba, the head waters of the Congo. During this same period, Sir Samuel Baker had made known the Albert Nyanza; Von der Decken had visited the Kilimanjaro district, and lost his life while exploring the Jub River. The death of Livingstone brought Stanley into the field as an explorer, with the result that the Victoria Nyanza was circumnavigated, and the Lualaba was followed to the sea and proved to be the Congo.

For more than half a century the explorers had the field almost entirely to themselves. The harvest of discoveries which rewarded their efforts during the period previous to 1877, transcended all possible expectations. Mr. Keltie appropriately calls it, "sixty years of preparation." During this time European appropriations in Africa were practically in a position of *status quo*.

In 1876, however, King Leopold, of Belgium, began to turn his attention to Africa, and, following up Stanley's brilliant Congo discoveries, founded the Congo State, which has since lost its free and international character, and "has lapsed into a Belgian colony." While giving all credit to the good faith and intentions of King Leopold personally, and making due allowance for various influencing circumstances, Mr. Keltie brings a heavy indictment against the administrative authorities of the State in general.

The action of King Leopold brought France and Portugal with their various claims to the front. Germany, desiring African colonies, took possession of large unappropriated portions of the West Coast, first in Damaraland (Angra Pequena), and later in the Cameroons district. This caused many heart-burnings both at Cape Colony and in England, and led to much diplomatic correspondence, from which,

however, Germany emerged far more successfully than did the then British Government. Mr. Keltie says: "Lord Granville naïvely reproached Prince Bismarck for intentionally misleading him . . . while Bismarck taunted Granville for his want of penetration."

In 1884 the Berlin Conference was held. Since then, as the author puts it in his preface, "the process of partition has been so bewilderingly rapid, . . . that it is difficult to realise clearly the various stages that have led to the existing conditions." In the succeeding chapters of his volume, however, the "various stages" are admirably dealt with, the rapid movements which have resulted in the present position of affairs in Africa being chronicled, with more or less detail, in a comprehensive and masterly manner.

Having been so successful on the West Coast, Germany, in 1885, turned her attention to the east side of the continent, and soon after established herself opposite Zanzibar. This territory was recognised as part of the Sultan of Zanzibar's dominions, and had been actually offered by its ruler to England. Our author says: "At any moment Sir John Kirk had but to say the word, and the Sultan would have placed himself under British protection." Seyyid Barghash protested against the action of Germany, but the British Government did not feel themselves justified in opposing Prince Bismarck's aims, and so did their best to induce the Sultan to accede to Germany's demands. This, however, he was not willing to do, and only gave way when threatened by a "formidable German squadron."

Sir William (then Mr.) Mackinnon had, some time previously, been appealed to by the Sultan of Zanzibar to take over, on behalf of a proposed British company, a portion of his territory, and develop it for their mutual advantage. In view of recent developments in East Africa, more especially in Uganda and the Victoria Nyanza district, it is interesting to note that what was probably the first official mention of a railway was made in a despatch (quoted at length in the volume under review), dated May 25th, 1885, from Earl Granville to Prince Bismarck, regarding the operations of Germany opposite Zanzibar. After assuring Prince Bismarck that the British Government had "no intention of opposing the German scheme of colonization in the neighbourhood of Zanzibar," the despatch goes on to say—"Some prominent capitalists have originated a plan for a British settlement in the country between the coast and the Lakes . . . and for its connection with the coast by a railway."

Mr. Keltie's work impresses the reader with the fact that nearly all recent British developments in Africa have been forced on by the action of the other European Powers, especially by that of Germany.

The German annexations at Angra Pequena led to the forward movement in South Africa, which has resulted finally in the spread of British influence northwards to the Zambezi and beyond. The action of Germany in the Cameroons, and of France in the Senegambia districts, has necessitated the consolidation of British interests on the Niger, and in the neighbourhood of the Oil Rivers. Portugal's bold claims for a trans-continental territory compelled the enforcement of British claims in Nyassaland. The earlier action of Germany on the East Coast led to the formation of the British East Africa Company. In like manner their later claims for "Hinterland" resulted in the 1890 Anglo-German Agreement, which recognised the protectorate of Britain in Zanzibar, and the extension of the British "sphere of influence" to the Jub River and the boundary of the Italian sphere on the north, and to the frontier of the Congo State in the west; Britain, in this instance, being compelled to pay for her former hesitation and indifference by the loss (if it can be so considered) of Heligoland.

The argument that Africa should be left to the African, which is often advanced, falls to the ground immediately, so far as Britain is concerned, when it is remembered that the other Powers of Europe decline to adopt such a course. It should not be forgotten that where Germany or France obtains a footing in Africa, British trade is placed at a serious disadvantage, owing to the protective tariffs levied by those countries. On the other hand the free trade policy of Britain leaves her "spheres of influence" open to all comers. Are we not also continually crying out for new markets? Besides all this, from the British point of view, it is our duty, in the interests of the native, to see to it that he and his lands are not wholly absorbed by those Powers which have not as yet proved themselves so well able as ourselves to work out the development of native races. The words of Lord Rosebery to this end are well worth remembering: "We have to consider," he says, "not what we want now, but what we shall want in the future. We have to consider what countries must be developed either by ourselves or some other nation; and we have to remember that it is part of our responsibility and heritage to take care that the world, as far as it can be moulded by us, shall receive the Anglo-Saxon and not another character. . . . We have to look forward beyond the chatter of platforms, and the passions of party to the future of the race of which we are at present the trustees, and we should in my opinion grossly fail in the task that has been laid upon us did we shrink from responsibilities and decline to take our share in a partition of the world which we have not forced on, but which has been forced upon us." The same spirit which runs through these words of Lord Rosebery seems to be breathed throughout the work of Mr. Keltie, although he confines his matter very closely to a relation of simple facts, and indulges little in expressing opinions.

The array of facts and developments recorded in our author's well-filled volume show clearly that a series of opportunities and responsibilities have, quite unsought, opened themselves up to Britain in Africa. They are the outcome in great measure of factors entirely beyond her control, and have been practically forced upon her. The opportunities are such, if rightly faced, as may have results second only in importance to those which have followed British policy in India. On the other hand the responsibilities of the situation are real and serious, and if met in a retreating spirit will be much more likely to increase than to diminish. Any playing of fast and loose in African policy can only end in disaster. Europe as a whole has put her hand to the African plough. Can England at such a juncture afford to hold back?

The great necessity for the development of British Africa is undoubtedly railways, that proposed from Mombasa to the Victoria Nyanza being especially important. A perusal of "The Partition of Africa" cannot fail to impress this upon the reader. The European Powers administering territory in Africa are committed to the policy of railway construction by the terms of the General Act of the Slave Trade Conference held at Brussels in 1891, which enforces upon the signatory powers "The construction of roads, and in particular of railways." Germany, France, Portugal, and even the Congo State are each, already, engaged in this work, as is also England in more than one portion of the continent. The mention of a proposed railway in the despatch of Lord Granville to Prince Bismarck (already quoted), and the vote of £20,000 by the late Parliament for a survey which has now been completed, proving the scheme practicable, conclusively show that we have undoubtedly encouraged the idea of railway enterprise in East Africa. From these responsibilities, more especially now that Imperial developments have arisen, it would be neither wise nor right to shrink, even if it were possible to do so without grave risk of disaster.

In spite of the drawbacks with which the British East Africa Company have had to deal, Mr. Keltie's book shows that they have succeeded in doing a very valuable

and useful work, already, in the opening up and development of their territory—commercially and otherwise. Most people, probably, will be inclined to agree with the remarks of Mr. Keltie, with reference to the crisis which recently arose when the Company found themselves compelled to withdraw from Uganda. He says: "The simple and obvious course would have been to send Captain Lugard back as soon as possible to continue his beneficent work, either directly under the Imperial Government or through the agency of the Company." His hope that the result of Sir Gerald Portal's mission may end, even yet, in this being done will be heartily endorsed by many.

Able chapters on "The struggle for the Niger" and on "Zambesia and South Africa," in which the work of Sir George Goldie and Mr. Cecil Rhodes, respectively, is referred to in fittingly eulogistic terms, deal generally with the developments in those districts, but want of space forbids further mention of them.

The volume concludes with a somewhat lengthy but most valuable chapter on "The Economic Value of Africa," which deals very fully with such questions as the general geographical features of the continent, temperature and rainfall, animal life, minerals, communication and modes of conveyance, population, the labour question, the rôle of the white man, colonisation, &c. The work is illustrated with twenty-one excellent maps, and is altogether a most valuable addition to the literature of Africa. Mr. Keltie is to be congratulated upon the highly satisfactory result of his arduous labours.

BRITISH NEW GUINEA. By J. P. THOMSON, F.R.S.G.S., &c. 8vo, 336pp. Map, portrait of Sir W. McGregor, full-page illustrations, and illustrations in text; with Appendix, with notes on the geology, flora, insects, reptiles, uses of shells, and dialects of New Guinea. *London: George Philip and Son, 1892.* Price 21s.

MR. THOMSON divides this book into twelve chapters: Historical Sketch—The Louisiade Archipelago—The D'Entrecasteaux Group—Chad's and Cloudy Bays—South-East of Port Moresby—North-West from Port Moresby—Ascent of Mount Victoria and Exploration of the Owen Stanley Range—The Lower Fly River—Middle and Upper Fly River—West from the Fly to the Anglo-Dutch Boundary—North-East Coast and Recapitulation—and an Appendix. The book is got up in the usual excellent style of Messrs. Philip and Son, and the illustrations are exceedingly well done and are very interesting in character. Portraits of natives, various tattoo markings, ornaments, weapons, tools, domestic utensils, fossils, and a good many views of scenery (some from photographs), with bird's-eye views and several diagrams of mountain groups add very considerably to the value of the book. The bulk of the matter has appeared before in the transactions of various Geographical and other Societies, and is now gathered together, pruned, the papers added to, and completed, to form for the time being the standard reference book to British New Guinea. The book will be very valuable from that point of view, and it also shows the remarkable progress effected in a very few years by the work of Christian missionaries and by the agency of a firm and settled administration—an administration which carefully guards the rights of the natives, and which has hitherto kept a tight hand on the introduction of undesirable white settlers and on the traffic in alcohol and gunpowder. The administration has to a large extent on the South Coast been able to stop the devastating native wars, and has thus very powerfully helped in an indirect way the work of the Christian teacher. It is a pity that Mr. Thomson has not made his historical chapter more complete. The work of Gill, Macfarlane, and other pioneer missionaries

is ignored, unless it is included in the paragraph—"Whilst the early struggles and heroic achievements of the brave and self-sacrificing pioneers in our Papuan possessions merit reward and receive universal admiration." And he seems to have been somewhat confused as to dates. This probably arises from the loss of the first manuscript of the work in the wreck of the s.s. Quetta. For instance, on page 4, we find Mr. Thomson writing: "We find the Rev. J. Chalmers and Mr. Chester, in 1867, visiting its south-east shore; and subsequently the same part of the coast was navigated by the missionaries in the 'Ellengowan,' who re-named the previously discovered Mai Kussa River the 'Baxter.'" There is confusion here. The "Baxter" River is now the western boundary of the British portion of the island. The mission was not commenced until 1871, and Mr. Chalmers did not join the mission until 1877. In 1871 the Rev. (now Dr.) S. Macfarlane and the Rev. A. W. Murray sailed from Maré, one of the Loyalty Islands, with eight native teachers to begin the mission in New Guinea.* Lieutenant Conner, on the staff of Captain Moresby, first reported the Mai Kussa River, but was not near it. He reported it as shallow, with a bar across the entrance. The "Ellengowan" was the first to find a clear entrance and to steam up, finding a depth of four or five fathoms for seventy miles, and sending up a boat fifteen to twenty miles higher. It is curious, too, that Mr. Thomson has overlooked the papers read from the Rev. S. Macfarlane and Mr. D'Albertis published in the Proceedings of the Royal Geographical Society, in vol. xx., 1876. The first expedition up the "Fly" was under the guidance of the Rev. S. Macfarlane, who gave permission to Signor D'Albertis to accompany him, and helped D'Albertis in his after-researches. Mr. Macfarlane's help was so much appreciated that D'Albertis appointed him one of his executors. Mr. Macfarlane also piloted in Captain Everill's expedition, and the Victorian Geographical Society presented a very flattering address to Mr. Macfarlane on the occasion. It is a pity all this is overlooked. The expedition was a dangerous and memorable one. Sir Rutherford Alcock, K.C.B., who was in the chair at the meeting of the Royal Geographical Society when the letter detailing the ascent of the Fly River was read, is reported to have said: ". . . Mr. Macfarlane's exploring party had shown courage, and that sound judgment which sprang from courage; and the result was, that it was one of the most satisfactory expeditions he had read of." We are thankful for good work by any class, and we should not forget those who had gone before us in exploration.† D'Albertis was not on the Mai Kussa in 1875, as stated on page 5, but on Yule Island, and a reference to the second volume of D'Albertis will make this clear. So much for the sake of historic accuracy it was needful to say, and no doubt in future editions the necessary corrections will be made. The book is an exceedingly interesting one, and is a valuable monograph on this until recently almost unknown part of the Empire.

The work of Mr. Thomson in relation to Geography has been very great, and he has placed geographers under a new obligation by the publication of these memoirs.

MY COUSIN'S WIFE. By RAY MERTON. 156pp. *London: Digby, Long and Co., 1892.*

THIS is a short story. With the story we have not much to do, but some part of the plot is laid in East Central Africa, and we fancy we could, without much trouble, find some characters to fit amongst our own members in that district. One of the singular things referred to in the book is the supposed finding of the

* "Work and Adventure in New Guinea," by J. Chalmers and W. Wyatt Gill, M.A.

† Dr. Macfarlane being a Manchester man naturally makes us jealous of the apparent ignoring of his work, a fair resumé of which may be found in the *Journal of the Manchester Geographical Society*, vol. ii., pp. 307-321.—Ed.

Osmunda Regalis of the Surrey hills, by the side of a bubbling spring on a mountain side in East Africa. The reviewer of the book in a Manchester newspaper found fault with it because of this unlikeness to Nature. He says, "in defiance of botany, he proceeds to find the *Osmunda Regalis* on the top of an African mountain." This only proves that critics are not yet all-knowing, as this *fact* happens to be the only one in the book. The story is also interesting.

THE REALM OF NATURE. (University Extension Manual.) By Mr. H. R. MILL, D.Sc., &c. Illustrated with maps and diagrams. London: John Murray. Price 5s.

THIS book contains a mass of information packed into a very small compass—so tightly packed, indeed, as to be sometimes difficult to extract. The language is generally clear and always concise—so concise that facts crowd each other out of the memory. It is difficult to know exactly for what class of readers the book is intended. The definition of "real" things, evolved from their distinction into subjective and objective things, is one that appeals to philosophic combativeness, but a few pages further on (p. 18) there is an explanation of angular measurement, simple and clear enough for readers to whom most of the book would be a hopelessly insoluble enigma. To the Victorians almost every chapter might well furnish the text for one or two, or even more, lectures; with suggestions for arrangement, and brief notices of theories and observations up to date; or, students who are attending lectures or reading up the subjects in larger and more copious works, may read over each chapter as a condensed form of several days' hard labour. The general reader with no technical knowledge will not, I fear, be much edified by such a sentence as this (found on p. 203): "Blue mud owes its slaty colour to chemical changes produced by decomposing vegetable and animal substances, in presence of the sulphites of sea water, which appear to be reduced to sulphides and decompose the ferric oxide abounding in all deposits into sulphide of iron and ferrous oxide." Nor will he learn much of the shape of the Earth from the following?—"The form of the Earth is termed by mathematicians a *geoid*, or earth-like figure; and it is more accurate to speak of it as a ball than as an ellipsoid or sphere." The chapters on Atmospheric Movements and Climate are difficult to understand, and the maps which should illustrate the text are so beautifully drawn as to excite admiration, but are so microscopic as to be useless, or rather dangerous to ordinary eyes; while the concluding chapters, the purely geographical part of the book, are those in which compression is carried to such an extent that they are only intelligible to those readers who are already advanced students.

"HEALTH HINTS FOR CENTRAL AFRICA." By the Rev. HORACE WALLER, F.R.G.S., &c. Price 1s.—These few lines, by the Rev. Thomas Wakefield, F.R.G.S., &c., formerly of Ribb, East Central Africa, condense all that need be said about this little book: "Very much obliged for your kind letter of 4th inst., and for Mr. Waller's little book on 'Health Hints for Central Africa.' I have read the book through with intense interest. It has very vividly flashed over my mind the experiences of old times in Africa. I have read it with my heart and nerves palpitating with almost feverish sympathy. The experiences it details are impressively familiar. It is a capital little book, and cannot fail to be very helpful to those for whom it is intended. I wish I could have been fortified with such a treatise 32 years ago. It would have been of great service—in fact, invaluable. It should be put into the hands of all missionaries and others going out to Africa as residents and pioneers."

VOYAGE OF THE NYANZA, R.N.Y.C. (being a record of a three years' cruise in a schooner yacht in the Atlantic and Pacific, and her subsequent shipwreck). By J. CUMMING DEWAR, late Captain King's Dragoon Guards and 11th Prince Albert's Hussars. With map and numerous illustrations. *William Blackwood and Sons, Edinburgh and London.* 1892. Price 21s.

"I HARDLY imagine that many yachts will follow our example, and come out to Japan through the Straits of Magellan and across the Pacific." In the story of the "Sunbeam" occurs this passage, and not many yachts have followed. Captain Dewar has, however, very closely followed in the track of the "Sunbeam."* He has visited a good many of the same places; indeed, the appearance of the book and the story of the voyage would seem to challenge a comparison. This, probably, is not intentional. There are sufficient differences to make the record interesting on its own account, and it is a pity the yacht was lost in the Caroline Islands, as the voyage would have been continued in a most interesting part of the Pacific. The owner of the "Nyanza" seems to have been unfortunate in his crew. Few, if any, of those shipped with him at the beginning were on the ship's books at the wreck. It seems somewhat strange that no more effort was made to rescue the yacht from the reef; perhaps the moral is, that any ship cruising in these waters should always have a good look-out, capable seamen, and auxiliary steam. It must have been a sad day for the owner when he had to leave his sea home on the reef.

Captain Dewar adopts an unfortunate tone towards missionaries of a different belief from his own, and makes one statement which we hope was made on insufficient information. The previous history of some of these Pacific Islands (a very sad one in some cases) seems to be entirely ignored by him, but cannot be forgotten by those who are acquainted with the facts; hence there is a jarring note on these points. But we do not wish to be fault-finders; every one who writes should write that which he honestly sees. Only the *casual* visitor should be certain that he sees correctly, and has competent knowledge to enable him to arrive at correct conclusions.

The voyage was a long one, broken by a run home whilst the yacht was being repaired. The story is well told and is full of interest, a map and index adorn the volume, and it is illustrated with a considerable number of autogravures, full-page illustrations, and smaller ones in the text. By the kindness of the publishers we are enabled to place in our columns some of the smaller illustrations.

The "Nyanza" was a schooner yacht of 218 tons, and carried a crew of 17 persons. She sailed from Plymouth on July 21st, 1887, and was wrecked on the Island of Ponapi, one of the Caroline Islands, on the 29th July, 1890. She sailed 42,784 miles, was at sea 411 days during her voyage, making an average run per day of 104.09 knots. Her best run was on the 10th February, 1889, lat. 33° 11' N., long. 140° 39' W., when she made 270 miles in the day. A tabulated table of daily positions is given from the beginning to the end of the cruise.

During the voyage the ship touched at the Azores, St. Michael's, the Canaries, and at Fernando Noronha. This island, which is a convict settlement, is not commonly visited, and Captain Dewar's description may be given:—

"Fernando Noronha is a convict settlement belonging to Brazil, and special leave must be obtained before any one is allowed to land. Merchant vessels are not

* The "Sunbeam" touched at the following places: Madeira, Teneriffe, Cape de Verde, Palma, Rio de Janeiro, River Plate, Sandy Point (Straits of Magellan), Lota Bay, Chili, Valparaiso, Tahiti, South Sea Islands, Sandwich Islands, Honolulu, Yokohama, Kioto, The Inland Sea, Pearl River (Canton), Macao, Singapore, Ceylon, Aden, Suez Canal, and home.

permitted to lie off the island. I was much struck by the appearance of the convict settlement from our yacht, as it lies at the base of a hill with a towering peak, many of the rocky precipices around it being of a quaint and peculiar shape. The messenger who had been sent on board our vessel had a strange and interesting history. He was a negro who had been condemned to a life-sentence for murder. About nine months before our arrival a mutiny had broken out amongst the convicts, and this man had undertaken alone a voyage to Pernambuco in order to give notice of the outbreak to the Brazilian authorities. The distance was 250 miles, on an open sea, and he accomplished the passage in a frail catamaran. For this courageous act he had received a full pardon from the Government, but he had grown so accustomed to the island that he preferred to remain there. The governor, Senhor Furtado de Mendonca, received us with the utmost courtesy and hospitality, placing at our disposal interpreters and guides, and affording us every facility for thoroughly inspecting the island. He was unable himself to talk either English or French, and we conversed with him through the medium of his clerk, an Italian. This man was a meek-looking polished individual, dressed in excellent taste, and gentlemanly in his manners. To our surprise we were informed that he also was a convict undergoing a sentence of penal servitude for life, his crime having been an exceptionally brutal murder of a whole family of five persons, for the sake of a comparatively trifling robbery. This exceedingly mild murderous ruffian conducted us politely over the settlement, explaining everything to us with great minuteness, and responding with alacrity to all our questions.

"The island of Fernando Noronha is about $4\frac{1}{2}$ miles long and $1\frac{1}{2}$ mile wide, the highest point being 1,000 feet above the level of the sea. A smaller island lies a short distance from it, rejoicing in the ominous name of *Rat Island*. An old-fashioned stone fort is stationed on a commanding situation overlooking the convict settlement, and a detachment of Brazilian infantry is stationed there. There are altogether about 1,600 convicts on the island, the majority of whom are negroes. Murder and forgery appeared to be the principal crimes which had been committed, and some of the prisoners certainly looked capable of most dastardly and desperate deeds. Others, on the other hand, like our worthy guide, appeared outwardly as innocent and guileless as lambs; and it was difficult to realise that many of these were amongst the most bloodthirsty offenders. Apart from their enforced isolation from their country, I could not help thinking that their lot was by no means a hard one for penal convicts. Their compulsory work extends over but three hours a day, and consists of ordinary field labour. The rest of the time they have to themselves, living in their own houses with their wives and children; and unless they are violent, mutinous, or incorrigible, they are not subjected to any prison discipline. If I were a convict, I should certainly prefer Fernando Noronha to Portland or Dartmoor.

"We dined at the governor's house at 5 p.m., and there we met three Englishmen connected with the British Museum, who had been spending some time upon the island, engaged in botanical and ornithological pursuits. They had gathered together a very interesting collection of specimens, and a most pleasant evening was spent in their society. They were living in the house as guests of the governor, and were unanimous in their expressions of grateful appreciation of the kindness which they had received at his hands. At the conclusion of our dinner the convicts were paraded in front of the governor's house, and sang an evening hymn to the Virgin. On our return to the yacht we found that the courteous governor had sent us nine sacks of cocoa-nuts, besides an immense quantity of bananas and fruit of various kinds.

"The next morning we returned ashore in good time, and after breakfasting at Government House we enjoyed a delightful day's ride through the island. Our guide

upon this occasion was another 'thorough gentleman,' who spoke French with perfect accuracy and fluency. Feeling assured this time that I was dealing with one of the officials, I asked him whether he intended to remain long upon the island. To my confusion he replied, 'Malheureusement, monsieur, j'ai encore sept ans.' He was a French convict, undergoing ten years for counterfeiting bank-notes.

"The island had looked barren and rocky from the sea, and I was quite unprepared for the extreme beauty of the scenery and the luxuriance of the vegetation which we encountered during this interesting day's ride. The coast-line is indented with many little bays, the sandy beaches of which are home-like and charming. Fruit is exceedingly abundant throughout the island, and the oranges were, to my mind, the best I had ever tasted.

"On our return from our ride we went aboard the yacht, accompanied by the governor and other officials, including the two officers of the detachment quartered at the fort, who were much interested in the Nordenfolt guns with which our vessel was provided. We worked the latter with dummy cartridges, greatly to the enjoyment and edification of our Brazilian visitors. In the evening we dined again with the governor, afterwards listening to the convict's band, which really played remarkably well.

"Next day, Thursday, September 15, after breakfasting again with the governor, we went for another ride, accompanied by some of the officials. Amongst other places, we visited the summer residence of the governor, where we were regaled with cocoa-nuts and delicious grapes. We rode to the extreme north end of the island, where we rested for some time in a shady grove of bananas, returning to the settlement about 2 p.m. In the afternoon I went over to Rat Island in the launch, and there I found a Brazilian who spoke English well, having spent many years in the United States. He was working the phosphate rock of which the island is mostly composed, and anticipated a most successful issue from his speculation. An English barque was lying off the island, engaged in loading the phosphate rock; and we found the captain and crew in a state of great excitement, as two of the sailors had attempted the night before to set fire to the vessel, escaping themselves in one of her boats. Fortunately the dastardly attempt had proved abortive, though the men themselves had got clear off in one of the ship's boats.

"Rat Island is covered with a thick undergrowth of creepers, which renders motion most difficult as soon as one gets off the narrow path. I shot four small turtle-doves, but owing to the dense brushwood I only succeeded in securing two.

"On returning to the main island at five o'clock, I took some photographs of the place, as also a group of the officials, after which we had our final dinner with the governor. Senhor Furtado de Mendonca, our friendly host, accompanied us to the beach to bid us farewell, attended by the whole body of officials. The convict band marched in front of us, playing a bright and inspiring tune; and the strains of their music were wafted across the water to our ears during the whole course of our passage from the shore to the yacht.

"Nothing could exceed the hospitable kindness which was displayed to us by every one, from the governor downwards, during the whole of our three days' visit; and amongst my pleasantest recollections of the voyage of the 'Nyanza' there will always stand prominently forth the convict island of Fernando Noronha."

The voyage was resumed, and calls made at Monte Video, Patagonia (the Welsh colony at Trelew was visited), the Falkland Islands, and, by the Straits of Magellan, Juan Fernandez, Peru, and then the real voyage across the Pacific was begun.

That most interesting outlier of the Pacific Islands, Easter Island, was visited, but the notices of it are somewhat disappointing. The island was amongst the earliest

made known to us by the 17th century navigators. The large images seem to have disappeared, and we are still in the dark as to the people who carved those remarkable monuments. The peculiar small wooden figures carved there are represented in the annexed cut, with a feather head-dress, obsidian spearheads, and a wooden fish :—



EASTER ISLAND.

- A—Feather head-dress.
- B—Ancient wooden figures.
- C—Obsidian spearheads.
- D—Wooden fish.

At the Marquesas Islands Mr. Louis Stevenson was found, and the islands under French control were found to be making some progress.

It is curious to find that "tattooing is no longer permitted, but all the adult natives whom we saw were beautifully and elaborately tattooed, chiefly on the legs, faces, and arms; the patterns were really most artistic, and the execution of the designs was remarkably good."

"The natives of the Marquesas are excellent boat-builders; in addition to their canoes they have some capital whale-boats. The canoes are dug out of the trunk of a palm-tree, and fitted with a large log out-rigger on one side. The paddles are neatly made and of a peculiar shape, with a short and very broad blade. Fishing is also abundantly practised, and the natives are very expert in the art. They use a very curious bait, made of mother-of-pearl tipped with hog's bristles—the glitter of this in the water attracting the fish much in the same manner as the spoon which is



TATTOOED LEG (MARQUESAS).

used in England." We have one which was formerly used by the New Zealand natives, and this contrivance appears to be widespread. "Most of the inhabitants of the Marquesas are splendid swimmers and divers."

The Tahiti Island, with its 9,562 inhabitants, 5,000 of whom are at Papeete, was visited, and appears to have given the impression of a luxuriant and prosperous island. It is a curious result of recent land-grabbing that this island, which has been proclaimed a part of the British domains, should have been allowed to slip out of our hands. It is a beautiful island. Capt. Dewar says: "The scenery was sublime and entrancing. Sometimes we were passing through a dense tropical forest composed of palms, bread-fruit, bananas, Pandanus, and many other trees, which were quite unfamiliar to me; whilst at other times our road skirted lovely calm bays with sandy beaches, glimpses of pretty native villages bowered amongst trees, being presented to our view."

We all remember the sad story of Pomaré.

The Samoa Islands were visited. "They consist of thirteen islands, three of which are inhabited." There tattooing seems to be very much akin to that of the Marquesas.

The secret of the success of Catholic missions seems here to be partly shown, and we cannot but admire the absolute self-devotion of those who go out to barbarous people at so great a cost. Here is a fair description of one of these devoted men, his appliances, and his work: "The French Catholic Mission, presided over by Father Forestier, was situated about half-way up the harbour (Pagopago), and consisted of one house built in European style, one room being fitted up and used as a chapel. A few native houses around the mission-house were used as schoolrooms, dormitories, &c. The Mission was supported by the Society for the Propagation of the Faith



NATIVE GIRL (SAMOA).

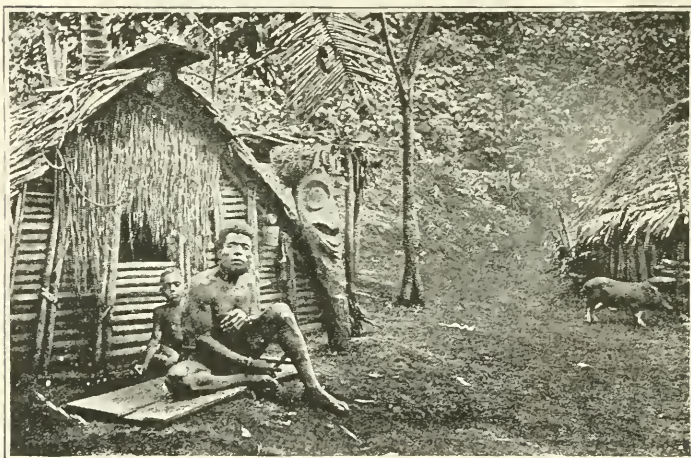
who paid the priest the magnificent sum of 200 dollars, about equivalent to £33 sterling a year. On this miserable pittance the priest had to live his lonely life amongst the natives, scarcely ever seeing a European, and without even the hope of returning to Europe to cheer him; for, unless his health was so completely broken down as to totally unfit him to perform his duties, it is an understood thing that a Mission priest is to live and die amongst the people whom he has undertaken to Christianise."

At Tongatabu a curious cave, two miles in length, was visited. Capt. Dewar does not speak with much kindness of Mr. Shirley Baker, who has for many years exercised influence in Tonga.

His interview with the natives of Fiji was very interesting. Cannibalism is extinct, and he describes six of the chiefs who visited the "Nyanza" as "handsome, polite, and dignified."



NATIVES OF AÔBA (NEW HEBRIDES).



NATIVE HUT, MALLICOLLO (NEW HEBRIDES).

A very full description of the French convict settlement at New Caledonia is given by Captain Dewar.

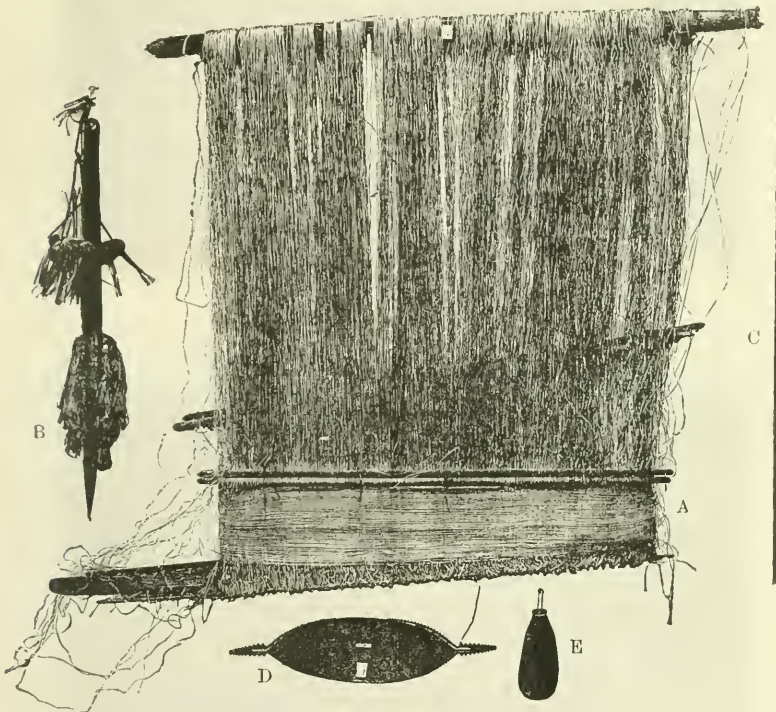
At Maré Island, a Canadian Presbyterian missionary was found, who had been on the island seventeen years, and with his wife received him with kindness. A

tablet was shown here, erected to the memory of five missionaries who had been murdered. The civilisation manifest in these islands has not been brought about except at a great cost of labour and suffering.

The account given of the natives of the New Hebrides is full of interest—the customs of the natives, the remains of old faiths, the dwellings of the people, and the black Papuans themselves, affording an opportunity of seeing a half-civilised population, with a good deal of aboriginal surroundings.

At Santa Cruz a native loom was found.

The loom in the Library from New Caledonia, secured by us through the kindness of Dr. Murray Moore, is almost the same. The annexed cut will enable



SANTA CRUZ.

- A—Loom with mat in process of weaving.
- B—Dancing club.
- C—Arrow.
- D—Wooden dish.
- E—Gourd for holding lime.

the general features to be understood. It is of great interest to people who manufacture textiles in another way.

The Sandwich Islands were visited, and at San Francisco the yacht was laid up for repairs. The delights on shore and up to Esquimalt were no doubt enhanced by the long sail through the Pacific.

In the resumed voyage Japan is visited, and the Captain appears to have a good time, alternated with difficulties with his crew. There are in the book two full-page illustrations of Japan of considerable beauty.



ESQUIMALT HARBOUR, B.C.



AINU WOMEN WEAVING (JAPAN)

The Ainu people appear to have attracted a good deal of Capt. Dewar's attention, and the book closes with a description of the loss of the vessel and the curiosities so laboriously collected. An appendix containing, amongst other matter, some Ainu stories is added. We have space left for only a short story, and that not the most interesting—

"LEGEND OF A FAMINE.

"1. There was something upon the seas bowing and raising its head.

"2. And when they came to see what it was, they found it to be a monster sea-lion fast asleep, which they seized and brought ashore.

"3. Now, when we look at the matter, we find that there was a famine in Ainu-land.

"4. And we see that a large sea-lion was cast upon the shores of the Saru River.

"5. Thus the Ainu were able to eat (viz., obtained food).

"6. For this reason *inao* and wine were offered to the gods.

"7. So the gods to whom these offerings were made *were* pleased and *are* pleased."

The book is very interesting, and we are sorry the journey was not finished successfully. We should have been glad if it had been possible to have a rather more scientific narrative, but that was evidently not the purpose of the Captain. He enjoyed the voyage, and the reader can enjoy it with him, without his troubles with the crews or the final disaster at Ponapi, or the annoyance of the Naval Court of Inquiry.

BRITANNIC CONFEDERATION. A series of papers by Admiral Sir John Colomb, Professor Edward A. Freeman, Mr. George C. Chisholm, Professor Shield Nicholson, Mr. Maurice H. Hervey, and the Right Honourable Lord Thring, with an introduction by Mr. A. Silva White, secretary of the Royal Scottish Geographical Society, with a map of the British Empire. *London: George Philip and Son, 1892.* Crown 8vo, 180 pp., with Index.

THE important question of the federation of the British Empire has been treated from the independent views of the various writers in the pages of the Scottish Geographical Magazine whose papers are here (by permission) reprinted. After an introduction by Mr. Silva White the various contributors have written on—"A Survey of Existing Conditions," "The Physical and Political basis of National Unity," "The Commerce of the British Empire," "Tariffs and International Commerce," "Alternative Measures," and "The Consolidation of the British Empire." The intention of the writers is to treat the subject academically as being one for legitimate discussion by students of applied Geography. The several chapters are—"A Survey of Existing Conditions," by Admiral Sir John Colomb, K.C.M.G., F.R.G.S.; "The Physical and Political Basis of National Unity," by E. A. Freeman, M.A., D.C.L., &c.; "The Commerce of the British Empire," by G. C. Chisholm, M.A., B.Sc.; "Tariffs and International Commerce," by Professor J. S. Nicholson, of Edinburgh; "Alternative Measures," by Principal M. H. Hervey, of New South Wales; and "The Consolidation of the British Empire," by the Right Hon. Lord Thring, K.C.B. The book is a small one but is full of matter for thought. It fairly raises the question, and the enormous difficulty of dealing with so many interests sometimes conflicting is indicated. The question is by no means solved, and the idea left on the mind after reading the book is that its solution is hardly possible of accomplishment. That it would be a good thing to do appears on the surface to be accepted, but how it is to be done is quite another thing. The tariff difficulty is at present the greatest of all. Perhaps the solution may come by the pressure of circumstances and by trial. The great communities across the sea who look to Mother England may be drawn closer for defence, and in that way other and closer relations may ensue but at present the light is very dim. The book has a map and an Index.

THE BRITISH ASSOCIATION AT EDINBURGH, 1892.

THE meeting at Edinburgh was a quiet one. 2,070 members were present. The hospitality was somewhat frigid, the time of the meeting having been chosen when a large number of the Edinburgh people were away. These incidental things were not of much consequence: the business of the meeting being conducted much as usual. The Geographical Section was the best at the meeting, for whilst there was an almost total absence of lions, the average quality of the papers was well sustained, and many of them were excellent.

It was rather curious that Edinburgh had to go to London for a Scotchman to preside, and it was peculiar that in the headquarters of the Royal Scottish Geographical Society a geologist occupied the chair as President, whilst another geologist took the presidency of the Geographical Section.

It was almost bewildering to find that in the Geographical Sectional Presidential Address one of the best geological papers of the session was given. "The Stability of Coast Lines" is a wide subject, and Professor James Geikie treated the subject in a fascinating way. "Geographers," he said, "must for the present be content to take the world as they find it." The Presidential Address by Sir A. Geikie, dealing with the "Transformation of the Earth," and [taking the neighbourhood of Edinburgh as the illustration, was a capital lesson in physical geography.

Papers were read by Mr. F. W. W. Howell "On the First Ascent of the Oraefa Jökull, Iceland"; Dr. J. Burgess, "Place Names"; Mrs. Bishop, "Travels in Lesser Thibet"; Mrs. Grove, "The Desert of Atacama" (a capital paper); Mr. J. T. Bent, "The Geography of the Zimbabwe Ruins in Mashonaland"; Mr. W. B. Harris, "A Recent Journey in Yemen"; Mr. W. R. D. Beckett, "The Eastern Laos States of Siam in the Mekong Valley" (a most important communication in view of the near eventualities in those districts); Mr. C. W. Campbell, "North Corea"; Professor Schoute, "A New Project for Drying Up the Zuider Zee"; and several others of minor importance.

The Reports of the Committees contained some information of a very interesting character. The Corresponding Societies Report referred, amongst other matters, to "Geological Photography"; "Disappearance of Native Plants" (when field naturalists and others came in for hard knocks); "Teaching of Geography in Primary Schools"; "Inquiry into the Condition of the Atmosphere in Manufacturing Towns"; "Destruction of Wild Birds' Eggs"; and the question of the interchange of publications by corresponding societies. This last question was well received, and will be carried out to the mutual benefit of the corresponding societies.

A large number of reports from Special Committees was received, amongst them, "On the Earthquakes and Volcanic Phenomena of Japan"; "On the Rate of Increase of Underground Temperature"; "On the Intensity of Solar Radiation"; "On Spectroscopic Measurements," illustrated with a number of diagrams; "On Wave Length Tables of the Spectra of the Elements"; "On the Erratic Rocks of England, Wales, and Ireland"; "On the Volcanic Phenomena of Vesuvius"; "On

the Flora and Fauna of the West India Islands"; "On the Teaching of Science in Elementary Schools," in which, very properly, geography holds a high place; "On Graphic Methods in Mechanical Science," with diagrams, a very valuable report; but perhaps the best report, and certainly the most interesting to geographers, was that "On the North-Western Tribes of Canada," with anthropometric tables, linguistic tables, the customs of the people, the geographical distribution, and numerous specimens or pictures of their arts and crafts. This is the report of the meeting. In other sections than E geographers found a considerable amount of valuable information.

Quite a large number of committees was appointed, amongst which may be marked the following:—"The Application of Photography to the Elucidation of Meteorological Phenomena," "The Action of Light upon Dyed Colours," "On Erratic Rocks of England, Wales, and Ireland," "Geological Photographs," "The Circulation of Underground Waters," "Zoology of the Sandwich Islands," "Zoology and Botany of the West India Islands," "Exploration of the Irish Sea," "Exploration of the Glacial Region of the Karakorum Mountains," "Scottish Place Names," "Climatological and Hydrographical Conditions of Central Africa," "Exploration of Ancient Remains at Axum and Adule in Abyssinia," "The Physical Conditions, etc., of the North-Western Tribes of the Dominion of Canada," "The Habits, Customs, etc., of the Natives of India," "Modes of Measuring Lenses," "The Rate of Erosion of the Sea Coasts of England and Wales," "The Elboltan Cave Examination," "Excavations at Oldbury Hill," "Migration of Birds as observed at Lighthouses," "Teaching of Science in Elementary Schools," "To organise an Ethnographical Survey of the United Kingdom," "The Prehistoric and Ancient Remains of Glamorganshire," "The Physical Deviations from the Normal among Children in Elementary and other Schools."

The resolution of the General Committee on the Ordnance Survey, promoted to a large extent by our member Mr. Crook, must not be overlooked, and is the very minimum of that which is desirable. It runs as follows:—

1. "That the publication of the one-inch and six-inch Ordnance Survey Maps is, in the interests of science, urgently required at the earliest possible date, no less than in the interests of industry, manufacture, and technical education."

2. "That steps be taken and provision made for keeping the Ordnance Maps up to date."

3. "That the maps should be made more accessible to the public, and should be sold at a lower price, as is the case in nearly all other official publications, such as Admiralty Charts, Bluebooks, etc."

It would have been well if another resolution could have been passed to the effect "That when a new edition of a map is issued all the old editions should be taken back by the Department from the agents at the price charged to them." It is unfair to the public that the agents for the Ordnance Maps should be expected to sell *all* the old editions in stock before they can offer the newer ones to a customer.

Edinburgh and its surroundings are so beautiful that few, if any, members could fail to enjoy the meeting, and with a few "bawbees" in his pocket a delegate would be bound to be pleased, and could not fail to appreciate the "Modern Athens."

PROCEEDINGS OF THE SOCIETY.

APRIL 1ST TO DECEMBER 31ST, 1892.

The 202nd Meeting of the Society, held in the Memorial Hall, Wednesday, April 6th, 1892, at 7-30 p.m., the Rev. S. A. STEINTAL in the chair.

Mr. ERNEST GEDGE, F.R.G.S., addressed the members on "The Work of the Jackson Expedition to Uganda—the Country, People, their Manners and Customs, Means and Communications, and the Need, Uses, and Value of a Railway from Mombasa to Lake Victoria." The address was illustrated with a large map of East Africa and a large number of lantern slides from Mr. Gedge's photographs.

The Rev. T. WAKEFIELD, F.R.G.S., moved a vote of thanks for the interesting and valuable address, which was seconded by Mr. J. E. BALMER, and responded to by Mr. GEDGE.

The 203rd Meeting of the Society, held in the Library, Monday, April 11th, 1892, at 7-30 p.m., Mr. BENJ. O'CONNOR in the chair.

Minutes of meetings held March 30th (201) and April 6th (202) were read and approved. The presentations to the Library and the election of the following members were announced:—

ORDINARY: Messrs. A. G. Clarke, J. R. Kenworthy, G. Larsen, W. H. Peterkin, and J. D. Wilde.

ASSOCIATE: Mrs. Thompson and Mr. H. N. Blake.

A letter was read from Mrs. Ross, thanking the Society for its resolution of sympathy on the death of Mr. Edward Ross.

Several communications were read, and the following papers—"Recent Explorations in British New Guinea," by Mr. J. P. Thomson, F.R.S.G.S. of Brisbane (see page 42); "The Meteorological Work of Mr. Clement Wragge in Queensland," by Dr. Black, of Edinburgh.

The papers elicited much discussion, and thanks were given to their authors and readers.

The 204th Meeting of the Society, held in the Large Room of the Chamber of Commerce, Friday, April 29th, 1892, at 7-30 p.m., the Rev. S. A. STEINTAL in the chair.

Professor T. H. CORE, M.A., addressed the members on "Meteorology in Relation to Geography." The address was illustrated with maps, a set of diagrams lent by Mr. Hall of the Hulme Grammar School, and with the blackboard.

Mr. WEIR, of the British Astronomical Society, and others, entered into the discussion, particularly with reference to Professor Ball's theory of the Ice Age.

Mr. MARK STIRRUP proposed, and Mr. ZIMMERN seconded, a very hearty vote of thanks to Professor Core for his admirable address, and to Mr. Hall for the loan of the maps. The PROFESSOR, in responding, replied at length to those who had addressed the meeting.

The 205th Meeting of the Society, held in the Natural History Theatre, Owens College, Saturday, April 30th, 1892, at 3 o'clock, the Rev. S. A. STEINTHAL in the chair.

Mr. W. E. HOYLE, M.A., addressed the members on "Zoology in Relation to Geography," and the address was illustrated by a large number of lantern slides.

A very hearty vote of thanks was accorded to Mr. Hoyle for his address and to the authorities of the College for the use of the Theatre, on the motion of Mr. BENJ. O'CONNOR, seconded by Mr. J. HOWARD REED, and supported by Mrs. BOSDIN T. LEECH.

It was resolved that the Secretary convey to the Archbishop of Westminster the very great regret of the Society at his removal from this district, and the hope that he may still be enabled to take some interest in the work of the Society which he has fostered and helped so greatly in the past.

The 206th Meeting of the Society, held at Brussels, April 15th, 1892, Mr. J. C. BLAKE in the chair.

A very pleasant visit had been made to Antwerp, &c., and hearty thanks were given to the leader of the party.

207th Meeting of the Society, held at the Welcome Hotel, Shrewsbury, Monday, April 18th, 1892; leader, Mr. BENJ. O'CONNOR.

The Rev. T. Auden, Chairman of the Archaeological Society, had, at the request of His Worship the Mayor of Shrewsbury, obtained permission to visit the Castle and he also led the members to the Churches, the remains of St. Chad's, the Quarry, the Old Drapers' Hall, the Market, the Old Town Hall, the Walls, St. Mary's Abbey, the Council House, the Old and New Grammar Schools, the old Magpie Buildings, &c. The members were allowed to ascend the tower of St. Julian's Church, from which a good view of the town was obtained.

A very pleasant day was spent, and very hearty thanks were voted to the Mayor, the Rev. T. Auden and Miss Auden, the owner of the Castle and the leader of the party. The return was made in good time.

The 208th Meeting of the Society, held on board the Firefly, river Weaver, Saturday, April 30th, 1892, Mr. JAMES EDMONDSON in the chair.

A number of members accompanied M. Fedotoff, of Kiev, and two of his Russian friends to Northwich, where Mr. W. F. Ward showed them the depressions caused by brine pumping, and arranged for a visit to a rock salt mine. The Salt Union had very kindly lent the steam launch Firefly, which took the party past the Anderton lift, down the river Weaver, and along the Ship Canal to Eastham, Mr. Saner, the engineer of the Trust, giving very interesting explanations of the engineering works on the route.

Very hearty thanks were passed to those who had contributed to make this so interesting and delightful a journey.

The 209th Meeting of the Society, held in the Zoological Gardens, Belle Vue, on Thursday, May 12th, 1892, at 5-30 p.m., the Rev. S. A. STEINTHAL in the chair.

Mr. C. Jennison had received the members, and conducted them through the gardens, noticing the rare animals and birds, allowing some of them to be fed, and permitting some members of the party to handle snakes and young crocodiles. A

considerable amount of interesting and valuable information was given, and some amusing anecdotes were told of the habits of the animals, &c.

The works at the Gardens were also inspected, such as the printing office, the bakery, gas works, carpenters' and smiths' shops, and the electric installations.

A very interesting afternoon was spent, and the members were much struck with the healthy appearance of the collections.

A very hearty vote of thanks was passed to Messrs. Jennison on the motion of the Rev. L. C. CASARTELLI, seconded by Mr. R. DAVIES.

The 210th Meeting of the Society, held in the Memorial Hall, Tuesday, May 17th, 1892, at 8 o'clock p.m., Mr. H. S. WILKINSON in the chair.

Mr. H. T. CROOK, C.E., gave an address on the Construction of Maps, dealing particularly with the Topographical Maps of the English and Foreign Government Surveys.

The address was illustrated by a large number of lantern slides, prepared for the occasion, and a splendid collection of Norwegian, French, German, and other maps belonging to the Society or lent by Mr. Hall, Mr. Crook, Mr. Wilkinson, and others.

Mr. O'CONNOR, Mr. REED, Mr. YULE OLDHAM, Mr. JACOBY, and the CHAIRMAN took part in the discussion. Thanks to Mr. Crook for his admirable address brought the meeting to a close at a late hour.

211th Meeting of the Society, held in the Memorial Hall, Friday, May 20th, 1892, the Rev. S. A. STEINTHAL in the chair.

At 7-30 p.m. the question of excursions was considered, and various suggestions were made. The invitation of the Marquis Doria, President of the Italian Geographical Society, to visit Genoa at the Geographical Congress was read and received with much pleasure.

Mr. ABEL HEYWOOD, jun., then addressed the members on "Travel in Western Norway." The splendid collection of maps presented to the Society by the Norwegian Government, and a large collection of lantern slides, from Mr. Heywood's and Mr. Woolley's photographs, were used in illustration.

Questions were asked, which were replied to by Mr. Heywood, and very hearty thanks were given to him for his address and the loan of his slides, and also to Mr. Woolley for the loan of some slides.

TRAVEL IN WESTERN NORWAY.

(By Mr. ABEL HEYWOOD, Jun.)

My acquaintance with Norway dates a long way back—something over twenty years—and during that time I have made many journeys to that delightful country, but as sport has always been one of the objects of my visits, I have seen less of the country than many of those who have made far fewer visits, though I have become very familiar with a few localities, and with a few people. I have managed, too, to pick up, as it is called, so much of the language as to be able to make myself understood, even if I cannot quite understand. You, no doubt, will not trouble to learn Norwegian, the conditions under which you will travel not requiring it; but I may mention that there are several dialects in the country, and that even Norwegians have sometimes considerable difficulty in understanding what the peasants say to them.

As I understand, the tour you are about to make is a "yachting tour"—that is

* The reference was to the intended excursion of about seventy members in the s.s. City of Richmond.

to say, you will live on board ship, will move about from fjord to fjord, and will make short excursions inland when opportunity serves. I have never been in this way. My time in Norway began long before such tours. There was only one small steamer to Bergen, going and returning once a fortnight, when first I went. But if I have never been in this way, so I never wish to. Although I love the voyage and the sea, I have pretty much of Dr. Johnson's feeling of repugnance to being confined to a ship when I reach the land. "No man will be a sailor," said the doctor, "who has contrivance enough to get himself into a gaol; for being in a ship is being in a gaol, with the chance of being drowned." But, notwithstanding this chance, the yachting trip is the best first trip that can be taken, and it is certainly the only one that a large party can take. When you go again, you must go inland, but then you must travel in small parties, the best of numbers being two.

There is one great physical feature of Norway which it is well, I think, that I should say a few words upon. As you sail up a great Norwegian valley, or fjord, as it is called, you will be struck, as you approach the head of the fjord where the rocks and cliffs are highest, with the number of waterfalls, many of them of great size and beauty, which are continually coming in sight. If you continue to ascend these valleys, when the ship can go no further—that is, on land—you will find the same feature always present; you are rarely out of sight of a waterfall or two, and it is difficult, until you come to think about it, to understand how this frequency of falls comes about. It is to be explained in this way, and it is necessary that you should bear it in mind in passing through Norwegian scenery. All Western Norway—the part you are about to visit—is an elevated plain, from 2,000ft. to 5,000ft. high. It is a rolling plain from which few peaks rise and those of no great height, the highest of them, Galdhöppig, being under 10,000ft (8,400ft). Just as Dr. Nansen found Greenland to be lying under a vast mantle of ice, which he estimated at thousands of feet in thickness, so once must Western Norway; and the present valleys and fjords are the courses by which the ice-streams reached the seas, and which have been delved and ploughed out by the passage of those streams and by water. The plain then is cut by the furrows which we now know as valleys, and the course of the streams which drain these enormous plains into the larger valleys are cut too, and thus you have it that rivers are continually coming over the cliffs that encompass you. If you look at the map you will see that these valleys are often many miles, sometimes scores of miles, from one another, so that you have a vast drainage emptying into the fjord or the inland valley; and as the plains above are covered with snow during the greater part of the year, the amount of water that has to come over the fesses is enormous. This is the great physical difference between Norway and a mountain district such as Switzerland. In the latter country, as a rule, if you climb a mountain you can only come down again, on the other side perhaps, but still down: in Norway if you climb a mountain you find yourself in a new country at a new elevation, a country with hills and valleys somewhat like the one you have left, except that the hills are lower: you are in a new land, with rivers, lakes, and mountains of its own, where the vegetable life and the animal life differ in many respects from the life lower down.

Following up any of the great glacier-made valleys (and you will have the opportunity afforded you, without doubt, of seeing several), before you reach the final elevated tableau you will pass through an intermediate region, which is often of very considerable extent, at an altitude of about 2000 feet. This may be properly spoken of as the limit of sœter life, though sœters begin to appear as soon as the cultivated fields at the bottom of the valleys have been passed. A "sœter" is the name given to a little house, or hut we should generally call it, which is away from the farm buildings and the cultivation of the farm. It is the country house to which,

for about four months of the year, part of the farm establishment is removed, and all the live stock of the farm, except the horses necessary for daily work and a few cows for daily milk. All the rest—cows, horses, sheep, pigs, and goats—go up to the mountains together; and two or three girls of the house—sometimes only one—live in the scoters in charge of them, and make butter and cheese of the milk. Going across the mountain plain, as I have sometimes done, I have met with a scoter tenanted by a solitary woman, 25 or 30 miles away from the nearest farm; and yet the women enjoy their summer sojourn as much as the animals do, and pine for it if anything delays their going up when the time comes. It is scarcely to be wondered at that they should enjoy it, if that difficulty of want of society could be got over, for they have, even at the highest elevation they can reach, a most delightful climate. During two months they have nearly perpetual daylight; they have an atmosphere of almost absolute purity and most invigorating and exhilarating quality; and they have the sight of everything that is beautiful and delightful in Nature, and also of the animals revelling in the tenderest and sweetest grass, everywhere full of flowers of greater beauty than those below. If Arcadian joys are to be found anywhere it is on the Norway mountains.

As you will certainly not be able to visit the mountains on this excursion unless you are possessed of the boat, which one of the Norwegian folk-stories tells about, that sails on land as well as in water, it is not necessary that I should dwell on what is to be seen on the mountains, or what animals or plants are to be found. I may, however, mention one plant, since you will be pretty sure, if you ever have real Norwegian fare, to meet with its fruit in a preserved form even if you are too early, as you will be, for the fresh fruit. The plant is what we call in this country Cloud Berry; in Norway it is *Multe Bær*. It is only rarely met with here, though I have seen it on Pen-y-Ghent in Yorkshire and near Loch Skene in Dumfriesshire; but on the Norwegian mountains there are thousands of acres of it—it is everywhere. The fruit is a yellow berry, very like a yellow raspberry and very pleasant to eat, especially with sugar and cream, as you will no doubt have it. The plant itself is a trailing one, something like strawberry, though not much like it except in habit.

I have mentioned how the Norwegian mountains are unlike those of Switzerland; but in our own Lake Country, where we have compressed into a few score square miles specimens of all the finest scenery of the world, we have more than one example, on a small scale, of what you will see in Norway. The best example is, I think, Borrowdale, a valley which has been made exactly as Norway has, and which bears the strongest resemblance to Norwegian landscape. As you go up Borrowdale you have to your left and to some extent to your right too, a mountain plateau above you, and if you want to reach the next valley you must cross over fells as they are called (fjelds in Norway) to reach them, and, though not in such numbers, for the drainage is, of course, much smaller, you will find waterfalls too, the most considerable of which are Barrow and Lodore, both of which are born on Armboth Fell. It is somewhat singular that the names of the geographical features should be the same in the two countries. Not only have you "fjelds" in Norway and "fells" in England, but you have "foss" in Norway and "force" in Westmorland, "beck" with the same signification in both, "holme" meaning an island in both, and in two or three places in the Lake country you have an island called by a Norwegian name, "Rampsholme," which is pure Scandinavian, and means Garlic Island.

I find myself wandering so far afield that I am almost forgetting the real work that I have before me. I was speaking a few minutes ago of the important part that ice, and its accompanying water, have played in making Norway what it is, and if you will, as you sail along the fjords, or drive along the valleys, you may see plenty of

evidence of the passage of huge glaciers along the course you are taking. Moraines, often of enormous size, are everywhere, and are at once recognisable, and at one place you are about to visit you will see a large lake which has been made by an enormous moraine blocking up the valley. This lake is Sande Vand, just above Odde, and you have to get up the steep side of the moraine before you can reach the level of the lake. This place you cannot miss.

As you ascend the magnificent torrent that flows through any valley, no matter which, you will probably be as much struck by the beauty and grandeur of the river itself as by the glorious scenery it flows through, and by the ever-present waterfalls that have been already spoken of. The stream above Odde, though not one of the largest, is a good example, and you are to see it. Glorious and all powerful as it is, you can scarcely realise that in a few months it will be reduced to a mere trickle ; but I am assured that that mighty stream may in winter be crossed on foot, for the sources of the water are bound up in ice—even the fosses are silent. In Spring, when the melting of the snow begins, the streams are not only what we see them, but they are greatly increased in volume ; but it is few of us who can see Norway except at the holiday sunshiny time. Norwegian friends, however, assure me that winter, not summer, is the time one ought to go there to enjoy it, and to really get to know its people.

For your excursions inland, all possible vehicles will be brought into requisition. You will only land at populous places, or you would find no means of making your excursions except on foot. Your experience then must not be taken as a fair specimen of what Norwegian travelling really is, when you have the road to yourself, and you drive away through the stupendous scenery that all the western valleys provide, free from the restraint of having to do a distance in a certain time, or of having to consider the convenience of any man alive except yourself. That is the way to enjoy Norway ; and that is the way I should advise you to go the next time. When you have had a holiday under these conditions of happy independence, you will know what liberty and enjoyment are ; you will know what Norway is—but not till then.

If there were time we might go on at any length to speak of the delights of this most glorious country, but I have a considerable number of pictures to show, and if you will allow me, I will now take them as prompters for what else I may be able to tell.

212th Meeting of the Society, held on board the steamship City of Richmond, June 4th, 1892.

About sixty or seventy members joined this ship on a voyage to Norway. The arrangements at the beginning were incomplete, and occasioned some inconvenience, but afterwards a very pleasant voyage was accomplished.

The 213th Meeting of the Society was held at the Salford Royal Museum and Library, Peel Park, Saturday, June 18th, 1892, at 3 o'clock.

A large party of members was received by the LIBRARIAN (in the unavoidable absence of the Curator), and a full examination was made of the varied contents of the Museum, after which an adjournment was made to the Library, where a number of books on Japan and on other Geographical subjects were inspected with much interest.

The thanks of the Society were given for the opportunity of examining the interesting and valuable collection.

The 214th Meeting of the Society, held at St. Bede's College, Alexandra Park Saturday, June 25th, 1892, at 3 p.m.

The Rector of the College (Rev. Dr. CASARTELLI) received the members, and conducted them over the very interesting commercial museum, library, and classrooms.

Mr. ISAAC THOMPSON took the chair in the Refectory, when the Rev. L. C. CASARTELLI, M.A., Ph.D., addressed the members on "Commerce in Relation to Geography." The address was listened to with great interest.

Mr. JACOBY proposed a hearty vote of thanks to the Rector for his address, and for his courteous reception.

Mr. FIFE SCOTT, of Fort Salisbury, seconded the motion, which was carried.

The RECTOR responded, and expressed his pleasure at receiving so many members.

The 215th Meeting of the Society, held at Worston, near Chatburn, on Saturday, July 23rd, 1892, at 6 p.m.

Alderman GREENWOOD and Alderman LANCASTER piloted the members to the Bold Venture Limestone Quarries, where the manager showed some glacier markings, and explained the method of obtaining the lime. The party then proceeded to the summit of Pendle, whence a fine view of the district, made interesting by Harrison Ainsworth, was obtained. Downham, and the old home of the Assheton's were also visited.

Thanks to the members of the Burnley Literary and Scientific Club for their guidance, to the manager of the Bold Venture Works, and to all who had contributed to the comfort of the party were very heartily passed.

Mr. LANCASTER and Mr. GREENWOOD responded.

The 215th (A) Meeting of the Society, held at the Old America Exhibition, Royal Botanical Gardens, on Wednesday, July 27th, 1892.

The proceedings were begun with a dinner in the Palm House, at the Gardens, to which about 80 members sat down. The Rev. S. A. STEINTHAL took the chair at 5 o'clock, the vice-chair being occupied by His WORSHIP THE MAYOR OF OLDHAM.

After dinner the CHAIRMAN proposed the usual loyal toasts.

Mr. Alderman W. H. BAILEY proposed the toast of "England and America," which was responded to by His WORSHIP THE MAYOR OF ROCHDALE and Mr. J. E. BALMER.

Mr. R. C. PHILLIPS proposed the toast of "The Immortal memory of Columbus." The Italian Consul, CHEVALIER FROEHLICH, replied.

The MAYOR OF OLDHAM proposed the toast of "The Manchester Geographical Society." The CHAIRMAN and SECRETARY responded.

After dinner an adjournment was made to the Concert Room, when addresses were given on "The Discoveries Leading up to those of Columbus," by the CHAIRMAN (see p. 129); on "Genoa and the Early Life of Columbus," by the CHEVALIER FROEHLICH (see p. 137); and on the "Columbus Voyages," by the SECRETARY, from a paper prepared by Major Ballantine, who was unfortunately too unwell to be present.

The addresses were illustrated by a large number of lantern slides, prepared by the "Victorians."

The 215th (B) Meeting of the Society, held at Chester, Saturday, July 30th, 1892. Mr. BENJ. O'CONNOR leading the party.

The Walls, the Old Derby House, the Church of St. John and the Priory remains, the Cathedral, the Roodee, the quaint old streets with the Rows, the River Dee, and the Roman Well were visited.

The beautiful Museum was also thrown open to the members. The Curator exhibited the Roman remains and the fine natural history collection. The settings of the birds in their natural habitats, the special work of the Curator, were very much admired.

After tea a vote of thanks to the leader and to the Curator for their kindness was very heartily passed.

The 216th Meeting of the Society, held at the Halton Castle Hotel, near Runcorn, on Saturday, August 13th, 1892, at 6 p.m. Mr. Alderman HEAR in the chair.

The Ship Canal Works at Runcorn had been visited, and had been examined with a great deal of interest, particularly the portion which had suffered from the irruption of water in the great storm. The Halton Castle grounds and the remains of this Norman stronghold were examined, and its history, very closely agreeing with that of Clitheroe, was discussed. A splendid view of the Mersey Valley from Warrington to Speke, with the Liverpool Water Tower, the high-level bridge, and the Ship Canal Works, was obtained. The new church and the ancient library of Sir John Cheshire were very kindly shown by the vicar, to whom grateful thanks were given.

A letter was read from the Hon. Miss Wilson Patten thanking the members for their expression of condolence on the death of Lord Winmarleigh.

Several photographs were taken, and the return was made in good time.

The 217th Meeting of the Society, held at the Station Hotel, Preston, Saturday, August 20th, 1892, at 6-30 p.m. Mr. E. W. MELLOR, J.P., in the chair.

The members were met at the station by carriages, placed at their disposal by Mr. Alderman Galloway and Mr. H. E. Sowerbutts, and were driven to the new docks. Mr. Councillor Yates Booth and the Engineer received them and explained the docks, the working engines, the river diversion, and other works.

A visit was then made to the Town Hall, where the Librarian received the members, who inspected the Free Library, the Guild Hall, the Newsham Collection of Pictures, and were then taken to the new Harris Institute, and were received by Mr. Hibbert, jun., who explained the features of this splendid building.

Thanks were heartily given to all those who had so happily contributed to the pleasure of the party.

A note from Mr. S. Ogden was read, acknowledging a vote of condolence on Mrs. Ogden's death.

The 218th Meeting of the Society, held at Mr. Tattersall's Hotel, Chatburn Wednesday, August 24th, 1892.

The members had a most enjoyable drive of about 26 miles (having lunch at the Swan and Royal Hotel, Clitheroe), driving to Mytton Church and Stoneyhurst College. They were received most kindly at Stoneyhurst, and the building, library

and observatory were exhibited with great patience and courtesy. Very hearty thanks were given to the fathers for their kindness.

The members then drove on through West Bradford, Grindleton, to Sawley Abbey, and back to tea at Chatburn.

The 219th Meeting of the Society, held at Tintwistle, on Saturday, September 10th, 1892, at 6 p.m. Mr. Councillor SHERRATT in the chair.

Mr. C. Wild and Councillor Sherratt led the members from Crowden Station along the reservoirs of the Manchester Corporation. Descriptions of the geology of the district, in reference to the water-gathering ground, were given, and the mechanical appliances of the waterworks were seen with great pleasure. Several photographs were taken.

Mr. WILD gave information as to the folk-lore, and the manners and customs of the people, and pointed out the old halls and some historic landmarks. Thanks were given to the leaders.

The 220th Meeting of the Society, held at Mr. Philip Whyman's house, at Alderley Edge, Saturday, September 17th, 1892, at 6-30 p.m.

Mr. Whyman met the members at the Alderley station, and led them to the Church, the Old Tree (the Monkey Tree), the Old Hall, School, Smithy, and through the gardens of Alderley Hall and the magnificent Beechwood, past the copper mines, by a very beautiful field road, to his house, where provision was made for the members, who spent a very pleasant evening. Very hearty thanks were given to Mr. and Mrs. Whyman for their kindness and hospitality, and to Lord Stanley's steward for his permission to see the grounds and the woods.

The 221st Meeting of the Society, held at the Museum, Queen's Park, Saturday, September 24th, 1892, at 6-30 p.m. Mr. CHARLES WILD in the chair.

Mr. J. D. Wilde met the members at Barnes Green, and led them through the beautiful Oliver and Boggart Hole Cloughs.

Descriptions of the neighbourhood were given, and reference was made to Dr. Taylor's house (Booth Hall), Sam Bamford's cottage, and the site of the Boggart House.

Very fine examples of the effect of water action on sand and clay were seen, and several photographs taken. After visiting the Simpson Institute, Mr. and Miss Wilde entertained the members to tea at the Queen's Park Museum, and thanks were given them for their kindness in leading the party.

The 222nd Meeting of the Society, held on the river Weaver, Monday, September 5th, 1892.

Mr. Mark Stirrup, F.G.S., had organized a joint excursion of the Geological Society and of this Society. The party proceeded by train to Northwich, by boat down the Weaver and along the Ship Canal to Eastham, where tea was provided, and thence to Liverpool. The trip was very successful, and was much enjoyed.

The 223rd Meeting of the Society, held at the Memorial Hall, Wednesday, October 5th, 1892, at 7 p.m. The Rev. S. A. STEINTHAL in the chair.

The Chairman read the following letter in reference to the Presidency of the Society :—

Marlborough House,

Pall Mall, S.W., October 4th, 1892.

DEAR SIR,—I am desired by H.R.H. THE DUKE OF YORK to say that it will afford him much pleasure, in reply to your request, to become the President of the Manchester Geographical Society.—Believe me, faithfully yours,

(Signed), F. DE WINTON, Major Gen.,
Comptroller.

The reading of the letter was greeted very cordially.

Major-General Sir FRANCIS DE WINTON, R.A., K.C.M.G., then addressed the members on "Canada : its Railways, and the North-West" (see p. 83). The address was illustrated by maps (general and geological) of Canada, lent by Professor Boyd Dawkins, a number of lantern slides, presented to the Society by the Grand Trunk Railway, also with some lent by the Canadian Pacific, and by some maps and papers given by these two railways for distribution.

Sir F. de Winton replied to questions on Canada and emigration.

Mr. Alderman MARK moved a vote of thanks for the admirable address, which Mr. J. THEWLIS JOHNSON seconded, making some reference to the question of Free Trade with the Colonies. Sir Francis acknowledged the vote, and was then besieged by members asking questions and seeking further information.

His Worship the Mayor of Manchester and Mrs. Leech entertained Sir Francis de Winton at the Town Hall.

The 224th Meeting of the Society, held at the Cheetham Town Hall, on Wednesday, October 19th, 1892. The Rev. S. A. STEINTHAL in the chair.

The Chairman, Mr. Samuel Ogden, J.P., and other members of the Council, received the members at 6-30 p.m.

Major Ballantine's paper on "The Voyages of Columbus" was read* and a large number of lantern slides were shown.

Mr. R. C. PHILLIPS read the following letter from Mr. A. B. Wylde :—

SUAKIN AND DISTRICT.

Belonie, Khor Arbat, Duroor,

19th August, 1892.

MY DEAR MR. SOWERBUTTS,—I owe you a letter, I believe, for a Christmas card that I have still on the wall of my hut before me. I am sure it was very good of you to send it. Here I am not in the land of luxuries, so cannot return you one.

I came up here to take up my quarters nearly a year ago, to plant cotton with the natives, but arrived too late for the floods, so only had the benefit of the winter rains. The locusts ate the young cotton down, and very little of it recovered, so I have done very badly, and first years starting a new enterprise are, in my opinion, always a failure. It has been so in my case. I am, however, to the good in this way. I have about 1,500 acres of ground well cleared for planting next month, and have commenced to get a semblance of work out of the natives, which they did not do before. In former years they only cultivated a few acres of dhurra, and were supported by their flocks. The latter have now dwindled down to a few sheep, goats, cows, and camels—the balance left them by the rebels. I had to commence to teach them how to cultivate, their ideas on the subject being vague ; to open irrigating ditches and to put dams across the waterways, so that the ground got the benefit of the flood water,

* This paper will be printed subsequently, with a chart in illustration, prepared by Mr Bernhard Darbishire.

instead of its running away into the sea without being utilised. The cotton eaten down last winter by the locusts has sprung up very well with last month's rain and flood, and if we are free from these pests this year we ought to do well with the 200 acres now planted. I hope to get another 400 acres under cotton this year, and the rest of the ground with dhurra and duccan, to be replaced by cotton next.

The people are still miserably poor, and it will take them some few years to recover the past nine of misery. Mahdism is dead along the whole coast and well into the interior, and its collapse will be much quicker than most people imagine. If the Egyptian advisers will only play the proper game, and follow what I wrote in my book, the Soudan will soon open up. They have done so to a great extent—I may say everywhere with the exception of Tokar, where they have behaved in a very unjust and arbitrary manner, and the population have gone again and it will be with great difficulty that they are got back. I believe I am the only person that they will listen to, and I do not intend to do any more work gratis, and unless I am paid I shall not stir in the matter.

I dare say you have followed Soudan events so much that you always remember what I always said at home. Let me get the tribesmen to cultivate, and Mahdism will not bother any one any more, as the tribesmen will look to the merchants as being their friends. I got them to cultivate in 1889 and 1890. The dervishes took the majority of the produce, and then the tribesmen told the Government that they would help to get rid of the dervishes. It ended up in taking Tokar in February, 1891. Last year the Government seized all the land at Tokar belonging to the tribesmen and re-allotted it in small parcels of five to ten acres, men having as much as 5,000 acres being reduced to beggary. They then taxed the cultivation, and would not let the tribesmen remove their cotton until the crop was all finished. Then they said they would accept the amount of their taxes in cotton at 30 piastres, say 6s. the kantar of 120lbs.—an absurdly low price. Then the Greeks, Jews, Copts, and Syrians spread reports among the tribesmen that if they did not sell their cotton to them no one would buy it, so the natives sold what they had at about 4s. the 120lbs. and packed up their belongings, and have gone out of the Egyptian jurisdiction to Filik, the Gash, and Kassala, to where the dervishes still are in small numbers, but not in sufficient force to be able to touch the tribesmen. I settled down at least 7,000 of the old inhabitants at Tokar; hardly any of them remain, and very few of those will grow cotton again. Nothing short of giving back the tribesmen's lands will be sufficient, and that the taxes are to be paid after the crop is ripe. What the Government wanted to re-tax the people—who have next to nothing—the first year for, I could never make out. England—that is, the Foreign Office officials—have played a mean trick on the tribesmen. They had proclamations issued, saying that England wanted peace, and did not want the lands of the tribesmen, or to retax them. The tribesmen submitted and came in, after having lost nearly their all by the dervishes, and then the powers that be allow the Egyptians to take their remaining belongings from them and leave them as well plucked as a chicken on a poulterer's board.

I am going to move in the matter as soon as you people at home quieten down, and shall address the English Chambers of Commerce on the subject, as the injustice that has been done is a scandal, and it seems to people that I have deceived the natives, although *they* know I have not, and am ventilating their grievances.

Here the Government have not interfered in any way, nor have they made up their minds to tax cultivation. If they want taxes, they will not get them, as the natives have hardly enough to keep body and soul together, and, being at zero, there cannot be much got out of them. The position I am in is, therefore, none of the

best, and any day I may be told to go away, the same as I was at Tokar last August. The Government told me to get out, and not to talk to the Arabs, so out I had to go. I don't know the law on the subject, but I think I ought to be allowed to make my living in an honest manner, and to be allowed to help the natives to improve their position. I have spent many years of my life opening up, pacifying, and improving the country, and ought to be compensated, especially as proclamations justify my actions.

I want to know if you will do something for me. I want to get some hand gins for cleaning cotton and seed, and I believe in the last few years great improvements have been made in their construction. The natives and I, as far as cotton cleaning is concerned, are in the hands of the Jews, Greeks, and Copts. It would be much better for us to clean our cotton by hand at the different places where it is grown, feed the cattle with the seed, and return it to the ground as manure, than to pay to send it into Suakin and then on to England. We get a better price for the cotton when it is cleaned, and the Banians will take it for Bombay, which makes competition with the Levantines. Labour is also cheaper here, and the cultivators will be cleaning their own cotton, and therefore take more interest in their work. I believe gins worked by two men are made to clean from 12 to 15 cwt. per day. I hope I am not asking too much of you to send me the particulars I require.*

Trade with the interior is opening up. When I left Suakin last month there were over 500 Jalans from Khartoum, Darfur, and Kordofan, with gum and produce, and at least 5,000 camels had arrived. These 500 Jalans, until I got the Suakin-Berber route opened up, were rebels. I had long talks with them, and when the season opens up again in November and December, they will all be back, with many more. Every Jali that comes in means one less rebel, and they spread amongst their friends the benefits of peace and trade. So there is already nearly all the commercial people in the Soudan—and they form by far the largest number of the influential population—on the side of law and order, and they will aid the fall of Mahdism if they know they are not to be put under the Egyptian Pasha again. I believe I have won nearly all the military people over to my way of thinking—that the Soudan question is not a purely military one, and that it is better that the merchant should go first and win over those that want to trade and live quietly, and then call in the military to put down those who do not want commerce to go on. The friendly people are thus saved, and the bad characters only killed.

We have had a very cool summer at Suakin up to the end of July, but here it is very hot this month; the highest shade temperature being 117°, and no midday shade temperature under 100°. The south-west monsoon has blown up to Suakin this year, which accounts for the cool weather, and the heavy rains also have lowered the heat of the desert. The 64 miles north here makes the difference. Our prevailing wind has been north and north-west, which brings in all the heat of the Zakenhelt desert, the most infernal spot on God's earth, I believe. If you would like a memorandum later on for the Geographical Society, I will send you one. I don't think there will be anything very new, but still more details about the country. Just before leaving Suakin, I was up to the Habab country, and as far north as Abou Madafa, near Berenice.

The Pasha and I caught a slaver in the North running contraband goods to the remaining dervish Emeer. An expedition was sent against him from the Nile, and he was blocked from the sea. The result was that his band was broken up, 70 odd slaves caught, and Mahamed Naserie, the last Emeer in the country, taken prisoner and sent to Assuan.

* This information has been kindly supplied by our member, Mr. Bramwell.

With best remembrances, and hoping you are still managing to survive your wretched climate, which I never want to see again in winter,—Believe me, yours very sincerely,

A. B. WYLDE.

The Secretary read a few notes on

THE HAUSA ASSOCIATION.

In the Western Soudan, the two chief tribes are the Hausa and the Fellani. The two tribes are probably nearly related; but whilst the Fellani or Fulbe are pastoral, fanatical and warlike, the Hausa are not fanatical, and are developed into a commercial race. The language is spoken from Soudan (about Lake Chad and the higher Niger) to Tripoli, and is used by about twenty-five millions of people.

The late Mr. Robinson went out to Africa to study the language and the manners of the people. He made very valuable collections, but, unfortunately, died before his work was finished.

A Society has been formed at Cambridge University, of which the Rev. J. O. F. Murray is Secretary, for the purpose of completing Mr. Robinson's work, and of carrying it forward. This Association has offered a scholarship of £200 a year for this purpose.

Mr. A. Herbert Hallen read a paper of great interest on the question before Section E at the British Association at Edinburgh, and Mr. Murray has forwarded the following note on the subject:—

Emmanuel College, Cambridge, October 12, 1892.

HAUSA ASSOCIATION.

DEAR SIR,—We have collected a small nucleus of subscriptions sufficient to justify us in electing one "Robinson Student," and we have a "General" and an "Executive" Committee. The Executive Committee meets on the first Friday of every month, at the "Surrey House," Victoria Embankment, but at present our deliberations have been confined to the details of the formation of the Association, and to the collection of subscriptions for founding our "Studentships."

We have received from the Church Missionary Society, and from Mr. J. A. Robinson's family all rights over the literary material, including the new translation, which he had just completed, of the Gospel of St. Matthew into Hausa, and the MSS. of one or two Hausa poems which he had managed to secure from Mallains at Lokoja before his death.

Dr. Harford Battersby has accepted the position of "Corresponding Member" of our Association, and has been for some few months on the Niger. He is now on his way home again, if he has not actually arrived. He has been especially engaged on investigating the African fever, and I hope we may have some communication from him on the subject, which we may send in full or in summary for your benefit. Communications of this nature we hope to be in a position to contribute from time to time to the three Geographical Societies who have given us the support of their name. But we have to wait for our "Student" before we can feel that our work has really begun and before we have any "progress" to report,—I remain, yours sincerely,

J. O. F. MURRAY.

THE RUINS OF ZIMBABWE.

Mr. J. THEODORE BENT had sent from London a large number of photographs, and Mr. J. HOWARD REED made the following remarks upon them:—

Through the kindness of Mr. Theodore Bent we are able to inspect a valuable and interesting collection of photographs of the ruins of Zimbabwe in Mashonaland,

as well as of the interesting remains of stone carvings, religious symbols, pottery, tools, and weapons which were found by excavating. The remains of Zimbabwe were visited by Mr. Bent, accompanied by his wife, last year, for the purpose of archaeological research, with much success. His enquiries resulted in discoveries of a most interesting character, and prove beyond doubt that long ages ago a settlement of people existed in South Africa who had reached a high standard of civilisation. From the remains found, Mr. Bent believes that the originators of Zimbabwe were colonists, who visited the district in search of gold, coming most probably from Arabia. They were evidently settlers in a hostile land, as the ruins prove that they took every care to protect themselves from invasion, their settlements being placed in positions affording great natural strength, and being, moreover, fortified with much care.

From some of the articles found it is evident that these people were phallic, or nature, worshippers; and therefore, if of Arabian origin, must date back to long before the Mohammedan era. It is believed that the inhabitants were able to measure off the seasons of the year by means of the passage of the sun, the buildings being arranged in such a manner as to suggest, if not prove, astronomical reasons.

Mr. Bent is about to publish a work entitled, "The Ruined Cities of Mashonaland," in which he will explain fully the result of his enquiries and researches, and unfold to the world one of the most interesting chapters of African travel and exploration. The work is to contain upwards of one hundred illustrations, besides plans and maps, and will be divided into three parts. Part I. The journey up and first impressions. Part II. Entirely devoted to the archaeology, descriptions of various ruins, excavations and finds, notes on the ethnology and geography, and a chapter by Mr. R. W. M. Swan on the measurements and orientation. Part III. Journeyings northwards in search of other ruins and ancient gold workings, and an exit by the Pungwe route. This work will be looked for with interest, and will certainly be read with both pleasure and profit by a large circle.*

An interval, in which coffee was served, then took place.

A collection of lantern views, lent by Sir H. TRUEMAN WOOD, of the Society of Arts, and a short description of Chicago and the Exposition were given.

Chevalier FROELICH gave the following account of his visit to Genoa with the Chairman, as delegates to the Geographical Congress from this Society :—

THE DELEGATES AT GENOA.

On my arrival at Genoa, September 16, Royalty had departed, and with it the centre of attraction of a week's brilliant festivities, to chronicle which the leading European and American papers were represented by some of their ablest correspondents.

My arrival was timed not exactly for the departure of Royalty, as it would have been a great honour to have had the opportunity of paying homage to their Majesties; but the 100,000 strangers, who made bread scarce and lodgings, let alone comfort, unprocureable at any price, were in the road. But most of them had now gone, with my blessings. Trains and boats took them back to their homes in all parts of Italy, to Marseilles, Nice, and other foreign parts. They had left plenty of money behind, and, for your delegates' special delight, a flood of sunshine inter-

* Mr. Bent's book, splendidly illustrated, has now been issued.

changing with the electric light, profusely distributed, and a temperature of 80 to 85 degrees all the time we were there—a week or more.

As the King and Queen had only just left the night before, the picturesque, flourishing city, every part of it—on the sea-coast, stretching for miles along a semi-circle from East to West, as well as on the land side rising on the hill slope—was still in holiday attire, the flags of all nations fraternizing with the Italian tricolour. And the atmosphere was clear of the smoke from the salutes, kept up for a week by the ponderous guns of the colossal ironclads, representing 15 nations, lying peacefully side by side under a spotless blue sky, such as only Italy can show you.

A unique spectacle that in the great port of Genoa—an international assemblage of warships, a most imposing peace conference, to greet King Humbert and join the people of Genoa in honouring the memory of their great citizen. On no day of her history has that ancient port merited more the epithet “*La Superba*” (The Proud) than she did, when she welcomed to the Columbus Fêtes her King, Queen, and Heir-Presumptive. Those of the British officers who have attended many naval displays at home and abroad, agreed that they had never seen anything like the picture which the port of Genoa made, when the yacht “*Savoja*,” with the Royal Family on board, entered, Captain Wilson, of the “*Sanspareil*,” being the first to catch the signal from the Italian admiral for a Royal salute.

Two illustrations of that naval spectacle are on view here; another one showing the appearance of the great Opera House, “*Carlo Felice*,” on the gala night of Verdi’s “*Othello*”; and if you will kindly notice Box 15 you may picture your own delegates seated there on a subsequent evening; not with so many ladies as you see there now; no, they had to be contented with one only between them; but her intelligence and culture—an English girl—made up for a number; hence your delegates were quite satisfied.

Still another illustration shows the Columbus room, so-called from the great mosaic portrait presented by Venice to Genoa—one of a gorgeous suite of rooms in the Municipal Palace. A reception is going on, the Mayor escorting Queen Margherita and the King following with the Mayoress.

Again on a subsequent evening the members of the Geographical Congress were received and entertained by the Mayor on the same spot; while another night (I say *night* designedly, because they only start at about 9.30—consequently no intimation of carriages at 10.30) the Duke of Genoa, Queen Margherita’s brother—who spent a year or eighteen months at Harrow—was our affable host at the Royal Palace; and the Mayor and Corporation of Genoa—I must confess they did the thing handsomely all through—wound up the Congress by a sumptuous farewell banquet, at which, of course, your Society was again worthily represented.

Lastly, I am sure you will be pleased to learn that our Society and its journal, which in the few years of their existence, and mainly through the work of our indefatigable Secretary, have become so widely known, were on several occasions referred to in highly complimentary terms by distinguished foreign geographers.

The 225th Meeting, held in the Library, Friday, October 28th, 1892, at 7.30 p.m. Mr. THOMAS DENTITH in the chair.

The Minutes of Meetings held April 11th (203), to October 19th (224) were read and approved. The presentations to the Library were exhibited, and the election of the following new members was announced:—

LIFE: Mr. Edward Pilkington, J.P.

HONORARY: Mr. E. Delmar Morgan, F.R.G.S.

CORRESPONDING : Lieut. H. J. Coningham, F.R.G.S.

ORDINARY : His Grace the Duke of Devonshire, K.G., The Right Rev. the Lord Bishop of Salford, Mrs. D. A. Little, Mrs. Jethro Scowcroft, and Messrs. H. A. Armistage, Alfred Balstone, jun., Joseph Berry, Thos. W. Boyd, Councillor C. H. Braddon, M.D., J.P., W. J. Clarke, Edward Collier, J. H. Dobson, B. C. Done, L. T. Edminson, Bruce Findlay, Joseph King, D. A. Little, Councillor Daniel McCabe, J.P., J. A. Morton, Samuel Oakley, Edwin Pearson, Alexander Porter, William Redford, W. H. Robinson, John W. Simpson, A. Sumner, John Swale, Robert Tait, L. W. Wächter, Henry Whiley, and W. H. Worsley.

ASSOCIATES : Miss E. S. R. Williamson, Miss F. M. Williamson, Rev. A. Colbeck (in lieu of ordinary).

Several letters and communications were read, and the following papers :—

AN ASCENT OF THE MATTERHORN.

ON JULY 26, 1892, BY MR. WILLIAM LANCASTER, JUN., OF BURNLEY.

"I will get me to some far-off land,
Where higher mountains under heaven do stand,
And touch the blue at rising of the stars,
Whose voice they hear, where no rough mingling mars
The great clear voices!"

WE made the second ascent this year of this remarkable rock peak under circumstances of some difficulty. Since Mr. Whymper made his now historic first ascent of the mountain in 1865, attended unfortunately by the loss of four lives, there has always remained in the minds of mountaineers a half-superstitious dread of, and yet fascination for, the Matterhorn. There is something about its spire-like outline, its smooth, appalling precipices, the rapid changes of weather that it is so subject to, that will always constitute it an ascent of some difficulty, not to say of danger. For a fortnight before we made our ascent the mountain had been very little visible, wrapped in cloud and storm, and when the weather improved about the 21st, it was seen that very much fresh snow had fallen, and the rocks were coated with ice, and that some days must elapse of perfectly fine weather before an attempt could be made with any prospect of success, and as free as possible from danger. On the afternoon of the 25th a start was made for the cabin at the actual foot of the mountain, some four hours' climb above Zermatt, and standing at a height of about 9,000 feet above sea level.

The quarters were roughly comfortable, the straw on which we rested was sweet and dry, and a fire blazing in a little cooking stove before long ministered to the climbers' creature comforts. Our two guides were Peter Taugwalder, one of the survivors of the first ascent, and Joseph M. Biner, of Zermatt, both excellent mountaineers. At 3 a.m. next morning we started from the cabin by lantern light. At this early hour all things look very matter of fact, and mountaineering enthusiasm is at its lowest ebb. A scrappy breakfast of the remains of last night's supper, boots still wet with yesterday's tramp through the snow, and two or three hours' jerky sleep are not the best prelude to a hard day. In the early morning the mountain is quite free from falling stones, which later the sun loosens from the grip of the frost, forming one of the principal mountaineering dangers. The lower part of the mountain is easy rock climbing for some two hours to the second cabin, which was found to be full of snow and ice to the door and no entrance could be made.

The first cold steel grey of approaching dawn was faintly visible in the east. We extinguished the lantern, and hid it behind the rocks until we returned. In this

light the grand peaks look weird and ghostlike, almost repulsive. The night is dead, and the day is not yet born. Gradually a faint flush in the eastern sky gives promise of the day. The stars wink out and disappear one by one; slowly the cold snow and iron rocks of one peak after another are lighted up by a deepening crimson, and the rush of warm sunlight steals downwards from their summits, which were yesterday evening the last to yield it up; and then it is broad day, and all disagreeable remembrances of the early start are at once forgotten.

The ascent was continued, but the character of the rock changed to one of a more friable nature, making the climbing much more difficult, as every handhold must be tested to ensure its firmness.

Below the shoulder of the mountain the ascent is made some fifteen or twenty feet below the back fin or ridge; any stones coming down are quickly deflected down one face or the other. A little higher, when the ridge is itself struck, the qualities of the climber are put to a severe test, as the Matterhorn glacier is the first object arresting the eye, some 4,000 feet below.

The shoulder itself, which in good seasons is often firm rock, we found to be a steep slope of hard ice, and we spent much time in cutting steps into it. In fact, this was the most tickle part of the climb. The very steep rocks over the shoulder are made easy by a stout rope which hangs over them. The old chain has been broken into fragments by the lightning. We passed the place of the first accident some fifteen or twenty yards on the right; the slope gradually eases off, and the summit, 14,705 feet, is quickly attained.

This consists of a very narrow ridge, some fifty or sixty yards in length, of snow, with a few projecting rocks here and there, and except on the side from which the ascent has been made the crags seem to descend sheer down. The summit was attained at 12-15 noon. Not a single cloud interfered with the prospect. A score of mountains a hundred miles away were distinctly visible. The eye plunged down 10,000 feet to the village of Zermatt, with its huge hotels, which looked like children's toy houses. The plains of Italy melted away into thin haze. We could see the great peaks of the Oberland, the Jungfrau, the Mönch and the Eiger, which were one stainless white. The Maritime Alps, 130 miles away, were nearly free from cloud. The nearer mountains, Monte Rosa, the Weisshorn, and Dent Blanche were seen, and lastly, in the full sunlight, rose the monarch of mountains, Mont Blanc. The time allowed by the guides was all too short to drink in such a prospect. Their eyes had been ever on the alert for any change in the weather, and before the summit had been quitted fine thin gauze-like clouds were wrapping themselves around it.

It is one thing to ascend a mountain in safety and another to descend it. All the accidents on the Matterhorn have occurred in the descent. But carefully and slowly every step was taken; the rope was passed, the ice slope on the shoulder, the rock under which poor Burkhart died—these are the rocks where Dr. Moseley, despising the safety of the rope, slipped and was dashed to pieces. Burkhart's bag and broken camera passed on the way bore forceful testimony to the death of the young German and his guides, who last year were blown by a gale off the rocks. Not a slip occurred, and at 8 p.m. the party arrived in safety at the cabin, after seventeen hours upon the mountain, to find that the telescopes of Zermatt had been critically observing every step.

It is impossible to convey to other minds the rapture and wonder of such an ascent. The physical details of the view may fade away from the memory, but there is a solid, intense, pure joy that will long continue amidst the ordinary humdrum of Lancashire life, and which none can take away. The toil of limb is as nothing when cast into the balance against the memory of a reflective and thoughtful climb to the

craggy summit of the Matterhorn. One may say with George Eliot, in another sense :—

"I accept the peril,
And choose to walk high with sublimer dread,
Rather than crawl in safety."

A JOURNEY TO THE GOLD REGIONS OF SANDIA AND CARABAYA, SOUTHERN PERU.

BY THE CHEVALIER GUILLAUME (Consul for Peru at Southampton).

ATTENTION was called to these regions in our Journal of last year, and as any information respecting new gold-producing countries is at the present time attracting the attention of capitalists and scientific men, it is satisfactory to know there is yet one corner of the globe from whence we may draw an almost inexhaustible supply of the precious metal from a region extending over 10,000 square miles. The railways now in the course of extension in Peru will, in the near future, make this district less difficult of access. We are indebted to Mr. H. Guillaume, Consul General for Peru at Southampton, for the following report of an article which recently appeared in the *El Comercio*, of Lima, written by Mr. Francis German, a mining engineer, describing his recent visit to those parts : Mr. German passed up from the coast by the beautiful valley of the river Ilo to Loretta, where the temperature was from 62° to 68° Fahr., and the altitude 393 feet above the sea. The entrance to the valley produced a sad impression upon him as he found it entirely ruined, from want of irrigation, all the fields which formerly produced olives being entirely dried up, the natives using the precious wood as if it were ordinary deal. Thence he reached Hospicio, 2,952 feet, and after attaining an altitude of 4,100 feet, the descent became rapid down the valley of Moquegua to Riuconada. The valley of Moquegua is very productive and excellent for vine culture as well as every description of fruit-bearing trees, but the river which waters it frequently overflows its banks, and the cultivated fields adjoining it are then ruined. If to this is added the ignorance of the cultivators in general, it is not to be wondered at that the valley has not yet reached a greater importance. He then proceeded to Moquegua, the capital, now half in ruins ; from thence to the Cordilleras, passing Torata to Corumas, where there are many silver, copper, and coal mines. At Chiligua he encamped in the open desert, exposed to a violent storm accompanied with sleet, where his attendant became ill with the "sorrocho." He then passed the lake Candaravo 15,404 feet above the sea, picturesquely situated at the foot of the volcano of that name, and after he had passed Titire reached "Cacachara" noted for its mines 19,683 feet above the sea. From thence he descended to Puno, which is 13,800 feet. Puno is surrounded by numerous silver mines, which are for the most part abandoned, excepting those of a high ley as the Cailloma, Yanaoca, Quillo Quillo, &c. From Puno he took the railroad to Juliaca, where he remained several days preparing for his journey to Sandia and Carabaya. Leaving Juliaca he passed on to Saman, thence to Taraco, crossing in a balsa the river Rami which flows into lake Titicaca, and arrived in the evening at Huancané where he was received by the sub-prefect with great hospitality. He thence proceeded to Cojata, a place known for its annual fair, where the Indians exchange the native gold they extract from Poto, Sucre, Conzadores, Accocunca and other places, for manufactured goods. Here the Governor Senor Sanchez gave him a hospitable welcome. At twenty-seven miles distance from Cojata, by a picturesque road on the summit of lofty hilla covered with perpetual snow, he reached the famous mining district of Poto 15,400 feet above the sea and about 90 miles distant from Juliaca. He saw several gold-washings at Poto, but the distance from the railroad and from the woods of Sandia, made it very difficult to obtain iron and wood for constructing canals to

supply water to the mines. At present the canals, being made through sandy soil, lose most of their water by filtration. The Ananea hills are worthy of mention. They are covered with perpetual snow, but Srs. Zabala and Co. are working a gold mine there called Lumar Grande. Leaving Poto he passed on to Cuya-Cuya, on the upper part of the river Sandia, which is 11,292 feet above the sea, and visited a gold-washing, called Arequipa Pampa—which could be worked to greater advantage by dredgers—and lower down the river many other gold-washings. He saw the remains of an ancient aqueduct which had been constructed with remarkable skill by the Incas for bringing water from the Cordilleras to Sandia, and the ancient remains of washings and ruins testified to the existence of considerable workings in a remote period. In descending from the Cordilleras in no less than one league the contrast between the zones was very striking, for, quitting the snow-clad deserts of the Puna, one enters all at once a very rich valley showing numerous varieties of fauna and flora. The descent in this part is very rapid. The road consists simply of a series of steps, and in a distance of six miles he had descended 6,600 feet. Cuya-Cuya was formerly noted for its thermal baths which still exist, but completely abandoned and in ruins. From Cuya-Cuya he passed on to Sandia which formerly was a place of considerable importance. It is situated in a deep, narrow valley, between two hills, the river flowing at the bottom. In Sandia he remained five days, and the sub-prefect obtained for him twenty-five Indians. He arrived there on the 4th July. The town was *en fête*, preparing for the celebration of the great Day of Independence, 28th July. He was informed in Puna that if he took some earth in any of the streets of Sandia and washed it, he would find gold, and in fact, having made a trial with the ground the Indians had dug in preparing for the *fêtes*, he found particles of gold. He had paid the Indians money in advance to buy themselves food but they spent it all in drink and committed excesses which resulted in their being imprisoned, which occasioned a delay of five days. Further advances had to be made to them, but fortunately their food consisted simply of soup made of maize, flour, and meat, taken at night-time, and during the day they are satisfied by masticating coca. In Sandia he was told there would be difficulties experienced in the montana, and that he should take supplies of clothing and food. As regards the provisions the preserves decomposed by the action of the climate. All that kept good were the dried vegetables, condensed soup, and sausages such as are made in the German army. They left Sandia on the 7th July, with two practical miners, an interpreter, and twenty-five Indians for carrying the goods consisting of four rifles, a gun, dynamite, cartridges, mining tools, hatchets, knives, and ropes for drawing the balsas, a tent, and two dogs. At the end of the first day they halted at Caluanchaca, having travelled two leagues (six miles). The next day they reached Ichubamba. On the road they met with remains of an Inca road which passes on the summit of the Cordilleras from which probably Sandia and Carabaya owe their existence. From Ichubamba they took the road following the left side of the river, which was cut in the rock by the ancient Incas and is nearly five feet wide, and continued their journey to Pucaramayo where there is the hacienda belonging to Senor Montesinos, where they saw growing in luxuriance, oranges, pine-apples, plantains, coffee, &c. On the following day they reached Masiapo, a journey of three-and-a-half leagues. Here they crossed the Inambari in balsas, and continuing along the right bank of the river by a difficult road for six miles over quebradas reached the river Santiagopata, where they discovered aqueducts of considerable size made by the ancients for washing gold. They followed the road leading through the valley of Camarones, and after marching four miles reached the river San Juan del Oro, where they discovered the remains of several old reservoirs for collecting the rain-water for mining purposes, thence to Chunchumayo, where they remained three days

exploring old gold-workings. Resuming their journey they were obliged to cut their way through the dense forest with their machets, and reached the Yanamayochico, four miles distant. On the 19th July they continued their journey to Isillumá, fourteen miles distant. They crossed the river Ipamayo and reached Muspálpampa after marching six miles. Here they were obliged to remain two days by a terrific storm, accompanied by torrential rains. On the 22nd July Mr. German arrived at Chuntabamba after a journey of nine miles, and proceeded to Pilcomayo, where he discharged his twenty-five Indians and replaced them by twenty Indians of the district. He then again crossed the main river in balsas (rafts), and having marched six miles was again overtaken by heavy rains. They descended the quebrada of Chuntamayo, and arrived at Quinza Cruz, whence they continued their journey to the celebrated gold cerro of Montebello, 7,300 feet above the sea. He was much interested in this historically celebrated cerro, so many times worked, and so many times abandoned. He discovered nine separate tunnels into the hill, many 300 feet long, intersecting veins of rich quartz, and was greatly surprised to see abandoned there heavy machinery which it seemed incredible to carry there on account of the bad means of transport and the insecure footing offered by the existing road and which could only have been accomplished after an immense amount of labour. The bad weather again detained them for three days, and on the 1st August they commenced the descent of the river to Versailles and Huari-Huari, marching sometimes in the bed of the river, sometimes by zig-zag pathways and passing over improvised bridges. In the evening a copious rain obliged them to encamp at Puisipumaco. On the following day they continued their march, still using the bed of the river, and arrived early at Versailles, situated on the main river, where they encamped and constructed a balsa across it. The next day they passed to the other side of the river where they met with Indians washing gold. They continued descending the side of the main river to Pacayhuata, and thence to Pullani, and crossing the river arrived at Oroya del Inambari, and continued their journey through the quebradas of Machatacuna and Huaynatacuna, where there are gold-washings of considerable importance. According to information Mr. German gathered, they only washed earth which yielded four to five ounces daily. From samples of gold dust he obtained, it was very evident that 70% must have been lost in the operation, as only coarse grains of gold had been extracted. Montebello is the most Eastern gold-washing known, and beyond it extend lands as yet untrod, and forests not yet penetrated. Mr. German says he intends to make a special journey to explore these obscure regions but requiring rest after two months of continuous fatigue, he resolved to return to Puna. He returned by way of Tambo-Inambari, where he found a church and cemetery; from thence he proceeded to Patarani and Saguana, by a pathway cut in the rock in steps, and encamped at an altitude of 8,500 feet; from thence by Queane and Huaricupa to Sachapata, which is 13,800 feet above the sea. On the third day they reached the region of perpetual snow, losing the luxuriant vegetation of the Montana, but finding the open pasture plains of the Puna, where were grazing numerous herds of cattle, vicuñas, and sheep. They continued their journey to Tambo Uscuri and Esquena and arrived at Coasa where he remained three days obtaining mules for the remainder of their journey to Pucara, from thence taking train to Puna. In conclusion, Mr. German says: "My first wish is to impart to the people of Peru and the world at large the plain facts respecting the great natural wealth of these regions, and secondly, to obtain a favourable consideration of the Government and Congress to the granting of free concessions and guarantees for developing the resources of these regions and obtaining the introduction of capital and labour for the purpose of extracting from these mountains their untouched treasures for the advancement of Peru."

RAILWAYS IN PALESTINE.

BY MAJOR C. R. CONDER.

We are witnessing the first commencement of a very interesting historical episode in Palestine, and events which may in the future profoundly affect the history of the East. Ideas which, when I wrote them down twelve years ago, seemed to be ideas only for a future which might be very distant, are becoming facts, not through any artificial scheme, but by the natural action of the people who are most concerned. The railway which I proposed is now being started, and the colonies, to which I recommended the cultivation of wine, oil, and corn, of cotton and fruit trees, are now coming into existence in many parts of Palestine. It is an instance of the *litera scripta manet*, which is an astonishing evidence of the power of the daily newspaper press over the thoughts of men.

Still more astonishing is the fact that we are, it seems, to have, next year, a railway in Palestine. I do not refer to the Jerusalem railroad, or to the Fell railway or tram which French engineers say they are going to make along the old coach road from Beyrout to Damascus. It seems very doubtful whether a railroad over a mountain chain like the Lebanon can be made at all, or would pay for the great expense which would be incurred. But no engineer could live long in the country without seeing that the first and most natural line would be one connecting the capital with the sea-coast, by the shortest and easiest route; and this railway is not only practicable, but will, I believe, shortly be commenced. Whether the present trade would pay the shareholders is another matter, on which I am not capable of forming any opinion; but there can be little doubt that it would pay in the end. The presence of a railway means increased population along its course, increased cultivation, and, in time, increased commerce. It is true that exaggerated estimates of the importance of Palestine, as the granary of the ancient world, have been put forward—for the ancient world was small, and thinly peopled—but it is also true that the rich soil of Bashan produces excellent crops; and that Damascus, with its 250,000 inhabitants, is by far the largest of Syrian cities.

The line which is contemplated, I am told, would start from Haifa under Carmel, which is one of the best roadsteads on the whole coast. It would follow the Kishon River to the great plain of Esdraelon, which rises only 200ft. above the sea. It would then descend by an easy gradient down the Valley of Jezreel, and cross the Jordan. The plains of Bashan are some 1,200ft. above the Mediterranean, and the ascent to these forms the only difficult section of the line. I calculate that, by following the Valley of the Jermuk, they can be reached by a steady gradient of about one in sixty, which, though steep, is not prohibitive, seeing that the distance is not very great. When the plateau is reached the rest of the line would be along the old Roman highway of Damascus, which is straight and level; and here no difficulty would be found. Whenever accomplished, this will, I believe, be the first Syrian railroad. It may be a comfort to some to know that it does not pass through any of the holy places. Nazareth and the Sea of Galilee lie to the north, and Jezreel to the south. No doubt travellers would often use the line in visiting these sites; but there will never be a railway station in the place of the home of Christ.

The Jerusalem railway is a much older scheme. It has always seemed to me difficult to make, and very unlikely to pay its expenses. It is, I believe, now begun, and the line traced to the foot of the hills south of Gezer. This line may also be useful to tourists, as shortening the journey; but the real difficulties begin after Gezer is past; and when an ascent of 2,500ft. has to be made in a very short distance of some twenty-five miles. Probably, therefore, the Jaffa railway must content itself, for a long time to come, with its present achievement in crossing the Philistine

plain. There is only one other easy line, namely, along the sea coast to Egypt and Alexandretta. This in time will be made, but not perhaps until the country is more wealthy than it now is. Lines in Gilead, in the Jordan Valley, and over Lebanon, are all more or less impracticable from an engineering point of view, and the line which I believe I was the first to propose is the only one into which there seems as yet any desire to put British capital.

There are several interesting points which occur in connection with the Damascus-Carmel railway. In the first place, its construction would render yet more probable, in case of war, a conflict on the old battlefield of Megiddo or Armageddon. The possession of the only railway in the country would become the inevitable and single objective of the strategist. Supposing Damascus to have fallen, or to be besieged, and a relieving force to be landed under Carmel, the main contest would be for the passage of the Jordan, and on the Jordan passage Megiddo, and the Har-Megiddon, or "Mountain of Megiddo," look down. The defence of Southern Palestine from a Scythian invasion would be more easily accomplished along this line than by any other; and for military reasons alone the Turks should be glad to have this line made to the capital, and should discourage the making of any other further north—unless, indeed, they connected Aleppo with the sea, and defended the passage of the Euphrates on the old battlefield of Carchemish. The second consideration is more peaceful. The country has never had any roads since the Roman highways of the second century A.D. were allowed to fall into ruins; and this is perhaps one of the chief reasons why Palestine has remained so long out of the pale of that civilisation which is now approaching it, in Egypt and Cyprus, and which, indeed, has reached its shores already.

But in the nineteenth century railways often precede roads, and lead in time to their construction. With a railway over Bashan the whole character of the good lands east of Jordan would change, because they would be brought into easy communication with the sea and with the capital. At the present time communication is difficult, and since the Jordan bridges, of which there were three in the twelfth century, have been broken down, it is altogether cut off when the Jordan is in flood. This was one of the great dangers in rear which had to be guarded against in 1881, when we were surveying Moab; and it is the main reason why as yet no colonies in Gilead have been attempted. The Gilead hills present the most picturesque, the best watered, and the healthiest, of all the Syrian regions—less rugged and barren than Lebanon, and better watered than Judea. When a railway skirts the northern border of this region, Gilead also will be fitted to receive the growers of vines and the tillers of cornfields. The sparse population of the nomadic Arabs will retreat to the south and the east; and the scattered villages will grow up again into towns, such as we know to have here flourished from the Christian era down to the era of Islam.—*The British Architect*.

The death of Sir J. Farmer was announced and the Secretary was requested to forward a note of condolence.

The SECRETARY announced that the Royal Geographical Society had given permission to our members to attend their meetings and to use their library for purposes of research.

The 226th meeting of the Society held in the Memorial Hall, Wednesday, November 2nd, 1892, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

Mr. W. H. QUILLIAM, of Liverpool, addressed the members on "A Visit to Constantinople," and illustrated his address with a large number of fine lantern slides.

Mr. S. OGDEN, J.P., moved, and Mr. W. A. WADDINGTON, Burnley, seconded a hearty vote of thanks for the very interesting address. Mr. Quilliam responded.

The 227th Meeting of the Society held in the Mayor's Parlour, Town Hall, Monday, November 7th, 1892, at 3 p.m. His Worship the MAYOR OF MANCHESTER (Alderman Bosdin Leech) in the chair.

Captain F. D. LUGARD (accompanied by Mr. G. S. Mackenzie) visited Manchester on his return from East Africa and addressed the Society on "Uganda, its value to British Trade and the claims of its People to England." (See p. 101.) The address was illustrated by a large map of East Africa, some lantern slides, and hand maps distributed to the members present.

The Right Rev. the Lord Bishop of MANCHESTER proposed a vote of thanks to Capt. Lugard for his address, which was seconded by Mr. HENRY LEE, J.P., and carried.

A vote of thanks of the Society to his Worship the Mayor for the use of the Parlour and for his presidency on the occasion was passed, being moved by the Rev. S. A. STEINTHAL, and seconded by Mr. T. R. WILKINSON.

The 228th Meeting of the Society held in the Library, Tuesday, November 22nd, 1892, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

Minutes of meetings held October 28th (225th), November 2nd (226th), and 7th (227th), were read and approved. The election of the following members were announced :—

LIFE.—Mr. Frank Spence.

ORDINARY.—Mrs. Adami, Sir F. Forbes Adam, C.I.E., and Messrs. R. Hope Brown, James Cottingham, Walter Curbstone, B. H. Greenwood, Thomas Harker, Rev. C. N. Keeling, M.A., Councillor G. D. Kelley, J.P., R. G. Lawson, Ivan Levinstein, Alderman James Sidebottom, J.P.

ASSOCIATE.—Mr. T. G. L. Hobson.

Presentations were announced and several letters were read, including the following from the Rev. W. C. Porter, M.A., of the Universities Mission :—

Masasi, Lindi, German East Africa, Sept. 27, 1892.

Dear Mr. Sowerbutts,—We are going on quietly in these parts ; some alarm about Magwangwara has threatened to break up school, but it soon quieted down.

The Germans seem to have enough to do elsewhere, so cannot advance in this direction. We have a surprising amount of rain in the dry season ; I believe it was deficient in the rainy months.

I have to go off occasionally some sixty or seventy miles to the middle of the Makorde, Lumanga's, to look after the work there under one of our elder lads, and take on the way Chisanga's near the edge, who has made some profession of wanting instruction or teacher for children, but does not come forward much in helping towards it, but we must always hope.

Our work is greatly scattered here. I want to start a school and sub-station about twelve miles off, in another direction, near the upper part of the Nkaredi River, and also some seventeen miles towards Makonde, at a beautiful spot—Nerombo ; but one might go on and on.

The weather is warming up, and one gets dreadfully limp in the afternoon, and is apt to ruffle up too easily, be "Kali," as the boys say. I don't know whether it is Arabic, and connected with lemon kali.

You will be interested in a flower of species of "Strophanthus," not, I think, Kombé, but akin and beautiful, but I fear it will have lost its beauty before you get it. . . .

WM. C. PORTER.

Mr. JAMES BARKER addressed the members on "A Drive from Manchester to Carlisle." The address was illustrated by a fine road map of England and Wales, published in 1830, which had been presented to the Society by Mr. D. A. Little.

The following note, communicated by the Rev. L. C. Casartelli, M.A., Ph.D., was read:—

THE HURRICANE IN MAURITIUS.

The following report, communicated to the Mauritius paper, the *Merchants' and Planters' Gazette*, of May 3rd, by Dr. C. Meldrum, Director of the Royal Alfred Observatory at Mauritius, may be of interest to our members:—

Saturday, April 30.

The hurricane which raged for a few hours yesterday, the 29th of April, has in many respects been unprecedented in Mauritius.

Never till now has the island been visited by a cyclone or hurricane at any time between the 12th of April and the 1st of December. Hitherto the hurricane season of Mauritius has been supposed to begin on the latter and to end on the former day, and till yesterday there has been no exception to the rule.

Nor was there any sign of danger till yesterday when the barometer began to fall rapidly and wind to increase to a heavy gale. The suddenness, rapidity, and extent of the changes which took place in a few hours are without parallel in the annals of the colony.

The following table will for the present suffice to convey some idea of the changes in the barometric pressure and in the direction and velocity of the wind from 9 a.m. on the 24th to 9 p.m. on the 29th:—

Day and Hour.	Barometer.		Wind.	
	Cor. and Red. to sea- level.	Fall or Rise per hour cor. var :	Mean Direction.	Velocity in miles per hour.
	Inches.			
April 24 9 a.m.	30.059		E.S.E. $\frac{1}{2}$ S.	2
April 27 9 a.m.	29.913		E. by S.	15
April 28 9 a.m.	.905		N.E. by E.	12
4 p.m.	.816	—003	N.E. by E.	14
9 p.m.	.850	—006	N.E.	12
April 29 6 a.m.	.660	—018	N.E. by E.	22.4
8 "	.630	—029	N.E. $\frac{1}{4}$ E.	34.7
9 "	.576	—063	N.E. by E.	35.0
10 "	.480	—094	E.N.E. $\frac{1}{2}$ N.	40.0
11 "	.338	—131	N.E. by E.	52.0
Noon	.066	—251	N.E. $\frac{1}{2}$ E.	68.0
1 p.m.	28.517	—532	N.E. $\frac{1}{2}$ E.	96.5
2 "	27.990	—513	North	56.0
3 "	28.034	+048	W.N.W.	68.0
4 "	.520	+483	W.S.W.	112.0
5 "	29.059	+529	S.W.	82.0
6 "	.719	+151	S. Wrd.	26.0

In the above table the fall and rise in the barometric pressure is corrected for the daily variation, and from 9 a.m. on the 24th to 9 a.m. on the 29th the mean

hourly velocities of the wind are given, whereas from 10 a.m. to 5 p.m. on the 29th the rates of the velocity per hour are given as obtained from observations for intervals of two to five minutes.

It will be seen that at 2 p.m. on the 29th the barometer was at 27.990 inches ; that from noon to 2 p.m. it fell 1.045 inch ; that from 3 to 5 p.m. it rose 1.045 inch ; and that from 5 to 9 p.m. it rose .600 inch. The absolutely lowest pressure was 27.975 inches at 2.26 p.m., which is the lowest on record in Mauritius.

From 9 a.m. on the 28th to 1 p.m. on the 29th the mean direction of the wind did not vary much, but it occasionally showed a tendency to veer towards North, being at times from N.E. by N. to N.E. Between 1 and 2 p.m. it on the whole veered to North, and between 2 and 3 p.m. to W.N.W., oscillating considerably and soon after settling down at W.S.W.

After 11 a.m. the velocity of the wind increased much, being at 1 p.m. at the rate of 96.5 miles an hour and at 1.20 at the rate of 104 miles. But from 1.25 to 2.30 p.m. there was a lull, the velocity decreasing to the rate of 43 miles an hour at 2.33 p.m. It then began to increase again, and at 3.47 p.m. was at the rate of 121.2 miles per hour, but it soon began to abate, being at the rate of 72 miles at 5.20 p.m., 60 miles at 6 p.m., 47 miles at 7 p.m., and 26 miles at 9 p.m. By this time the weather was fine, the sky partially clear, and here and there stars shining brightly.

Seeing that from 9 a.m. on the 24th to 2 a.m. on the 27th the barometer had fallen from 30.059 to 29.903 inches, and that the wind, though light, had veered from E.S.E. $\frac{1}{2}$ S. to E. by S. a note was sent to the newspapers on the latter day stating there was heavy weather to the Northward, and that it had existed since the 24th, which, as usual in such circumstances, meant that there were indications of a cyclone away to the Northward, and it was travelling from N.E. to S.W.

But the wind having by 9 a.m. on the 28th reached N.E. by E., and the barometer being on the 27th 29.903 at the same hour, there was no apprehension, and in the afternoon of that day, the wind being still moderate from N.E., and the barometer falling at the rate of only .003 inch per hour, it was announced that there was no fear.

As already stated it was only on the 29th that the conditions became unfavourable, and at 9.40 a.m. a telegram was despatched announcing that the barometer was falling at an accelerating rate.

Other telegrams despatched at 11 a.m. announced that the velocity of the wind was at the rate of 52 miles an hour in the squalls, and that probably it would not exceed 56 miles an hour.

Soon afterwards the telegraph wires were broken, and all communications ceased.

The barometer continuing to fall at an accelerating rate, and the mean direction of the wind being nearly constant, it was inferred that the centre of the depression would, contrary to long experience, pass over the island, and that the wind would then come from nearly the opposite direction.

The centre, however, did not pass over the Observatory, but over a point about six miles to the W. of it, and apparently from that point it travelled across the island on an E.S.E. course.

As a rule, when the wind is from N.E., there is scarcely any danger of a hurricane in Mauritius. All our great hurricanes have commenced, not with a N.E., but with a S.E. wind ; and this is why, when the wind was from N.E. by E. at 11 a.m. yesterday, and the barometer at 29.338, it was considered probable that the velocity of the wind would not exceed 56 miles an hour. On the 12th of February last the barometer fell to 29.325, and the greatest velocity of the wind was 47.5 miles per hour from N.E., the barometer soon afterwards rising and the wind decreasing.

There are, apparently, only two ways of, in a measure, accounting for the passage of the centre of a hurricane over the island yesterday from W.N.W. to E.S.E. Firstly, the cyclone, which had been travelling to the N. and N.W. of the island on a S.W. course, from the 24th to the 27th, recurved to the S. and S.E., and then bore down on Mauritius; secondly, a small secondary cyclone, which was generated in the S.E. quadrant of that greater cyclone, travelled to the E.S.E. The latter is the more probable hypothesis, for the small but violent hurricane of yesterday, with respect to its extent, duration, &c., exhibited the characteristics of a local atmospheric disturbance.

On the night of the 27th and morning of the 28th there was a great deal of thunder and lightning, also frequent lightning during the night of the 28th. But the hurricanes of Mauritius are seldom, if ever, immediately preceded by thunder and lightning.

It may be stated also that from the 25th to the 29th there were from five to six groups of sun-spots, indicating a great increase of solar activity; and that from the 25th to the 28th there were large magnetic disturbances, the portion of the sun's disc on which there was a very large group of spots on the 12th of February being again on or near the sun's central meridian.

C. MELDRUM.

THE CONGO FREE STATE.

By MR. R. C. PHILLIPS.

I wish to bring before your notice the account which appears in the *Manchester Courier* of November 21st, of the series of contraventions of the Act of the Berlin Conference by the Government of the Congo Free State.

Notwithstanding the solemn assurances given by each and all of the Powers that the occupation of the Congo Basin had for its object the spread of commerce and civilization, and the agreement that trade was to enjoy unlimited freedom and exemption from all imposts save for services rendered by the several states, the Congo State shortly commenced a series of most oppressive duties and taxation, with the result that the numerous traders in the district were forced, almost without exception, to retire from the territory in question, and seek refuge in the Portuguese or the French Congo.

It seemed, however, as if the complaints of the traders were not to be heard. With the greatest of difficulty could the public be informed of the violation of promises which was by leaps and bounds extinguishing all commercial enterprise; and in Belgium itself, where, if anywhere, the true state of affairs should have been understood, commercial associations were formed for the purpose of exploiting the commerce of the middle river, under the supposed encouragement and protection of the King of the Belgians.

These companies have, however, been as badly dealt with as were the traders of whom I have spoken. The natives are prohibited from selling produce, *i.e.*, ivory and rubber, to any but the State, and the companies have been obliged to close their houses and retire, after incurring vast expenses through the delusive representations of the State.

These doings are strongly commented upon in the articles in the *Courier* to which I have referred, but always with the proviso, "if the traders' account be true."

I can give the strongest possible confirmation to the statements of the traders; and I have always held that the aim of the Congo State was a commercial monopoly of the products of the country which they occupied by forged treaties in Africa, false declarations at home, and afterwards maintained by endless violence and extortion.

It is greatly to the honour of the Manchester Press that they have allowed mention of these serious charges to be made in their columns, when the metropolis refused audience to any animadversions on the conduct of the Congo officers of King Leopold; and I would refer you to the Manchester papers in support of the assertion that these things have been clearly foreseen for the last ten years, though seemingly proclaimed without arresting the attention of anybody capable of ameliorating the condition of affairs.

But the truth is becoming more and more apparent that the often-sounded note of warning was urgently needed, for it is to be feared that the mischief now done is for the most part irreparable.

But a strong, determined action could perhaps stay the devastation which is daily working evil in Africa; therefore, I once more ask your serious consideration to the statements of wrong-doing, which will surely awake those who are still asleep, dreaming of commerce and civilization, markets for our goods, and spheres of influence for our mission, on the banks of the Congo River.

The Secretary made some remarks on the subject, and several members joined in the discussion.

The meeting having been so protracted, several papers were held over.

The 229th Meeting of the Society held in the Memorial Hall, Friday, December 9th, 1892, at 7 30 p.m. The Rev. S. A. STEINTHAL in the chair.

Mr. W. ANGELO WADDINGTON (President of the Burnley Literary and Scientific Club) addressed the members on "Picturesque Sicily," illustrating his address with an interesting and admirable collection of lantern slides.

The CHAIRMAN moved a hearty vote of thanks to Mr. Waddington, which was seconded by the Treasurer, Mr. S. Oppenheim.

The 230th Meeting of the Society, held in the Library, Wednesday, Dec. 14th, 1892, at 7 30 p.m. Mr. JOB IRLAM in the chair.

The minutes of meetings held November 22nd (228) and December 9th (229) were read and approved. Presentations were announced, and the election of the following members:—

ORDINARY.—Messrs. James Blackburn, William Corbett, Councillor T. Eggington, J.P., John Harrop, John Mee, Joseph Sampson, James A. Taylor, W. Angelo Waddington, Lascaris C. Zlatko.

ASSOCIATES.—George R. Bosworth, W. Nelson Greenwood, F.R. Met. Soc., Arthur R. Scott.

The correspondence having been read, the following papers were presented:—"How a Lace Curtain is Made," by Mr. John Mortimer (see p. 115); "The New Standard Chart of Australia and New Zealand," by Mr. Clement Wragge. The papers were read by the Secretary, who also made some remarks on Lieut. Peary's Greenland Expedition and Dr. Nansen's projected exploration. A lively discussion ensued on the several papers. The hon. sec. of the Victorians (Mr. Reed) gave an account of the work of this section of the Society.

The 231st Meeting of the Society held in the Library, Friday, December 23rd, 1892, at 6-30 p.m. Mr. S. OPPENHEIM in the chair.

Minutes of meeting held December 14th (230th), were read and approved. The election of the following members was announced:—

ORDINARY.—Messrs. L. Aron, Walter Beer, Marcus S. Bles, W. H. Crabtree,

Charles Dreyfus, Councillor Hermann Goldschmidt, James Haarbleicher, Charles Illingworth, Charles Nordlinger, S. Sternberg, G. H. Young.

ASSOCIATE.—Mr. C. B. Milnes.

Presentations were announced.

Some correspondence and the following papers were read : "On the Methods of Missionary Work," by Bishop Smythies ; "Scientific Hints to Missionaries," by Rev. L. E. Baynard Klein, D.Sc., F.L.S. ; "Taxation in British Central Africa," by the Rev. Dr. Nicoll, Editor of the "Church of Scotland Mission Record" ; "Proposals for Manchester Class Lectures in Geography in 1741," communicated by Mr. C. Roeder.

After some discussion the meeting took a social form.

THE METHODS OF MISSIONARY WORK.

(By BISHOP SMYTHIES, now Bishop of Zanzibar, of the Universities Mission to Central Africa.)

I have to speak on the methods of missionary work, and I suppose that it is intended that I should confine myself especially to the methods with which I am acquainted in the missionary work in tropical East Africa.

First of all, I would say that missionaries have to beware of two dangers. It is necessary first, if they would do their work healthily and well, that they should avoid degenerating into traders, and acquiring large estates in the country in which they are missionaries, if that country be uncivilised and what we are pleased to call a savage country. I say "degenerating," because it is a degeneration from their spiritual office. I remember well that when I first went to East Africa I was requested by the chiefs of the country in which I happened to be to go and interview a chief who threatened to come down upon that country. I went, accompanied by a deputation, to the fort on the mountain in which he was. Already the smoke of the burning villages was seen in the neighbouring valley by the inhabitants among whom we worked. Among the questions that that chief asked me in that interview was how much land we had acquired in that country, and what possessions we had there ? And I was glad to be able to answer him : "We have one little shamba" (as we call the small farm) "which was granted to us by your grandfather, Kimweri, who was former king of the country." That was calculated to allay any jealousy which he might feel, and any jealousy which might rightly be felt by natives, of the foreign white man, so strange, so different from them in all his customs, who should come and settle in their midst, and be acquiring property or land. We know what degeneracy has overtaken missionaries in many directions when they have begun to trade, and have gradually changed their characters and become mere traders.

The second danger which has to be avoided in an uncivilised country by a missionary is the danger of becoming a chief. People will gradually gather round him, and it may be that in time of difficulty they would gladly welcome him in such a position. But surely that will be fatal to his spiritual power. Every missionary has clearly to discern between the two powers which God has placed in the world, that which we call the power of the keys and the power of the sword, and he has always to take care that in all he does he confines himself to the use of the power of the keys—those means of advancing the Gospel by persuasion and by the spiritual powers, granted to him by our Lord, never snatching, under whatever temptation, to gain a temporary advantage—never snatching at political power, or the power of force ; for this will be sure to recoil upon him hereafter and spoil all his work, if he goes out of his own sphere and snatches a power which God has not committed to

him. We are careful to teach our people that even heathen chiefs have their power from God, and that they are to be obeyed as holding a power from God. It is not our place as missionaries to usurp that power, but it is rather to persuade the chiefs to use that power by the light of the principles of justice and righteousness.

Then with regard to the constitution of the mission, I cannot help saying that I feel sure that our mission is right in giving the sole responsibility of work and action on the spot to the Bishop, and not allowing that responsibility to rest upon a committee sitting in London. . . . If it is to be referred from such a place as the country about Lake Nyasa to a committee sitting at home, before the message can be sent home and the answer can be sent back the occasion will have passed by and the advice will have become obsolete.

Then with regard to a practice in which we are peculiar. We offer no salaries to our missionaries. We offer to pay their expenses only. You may think it a strange thing, and if our mission rested on natural and not supernatural principles, it would be a strange thing for me to come to this country, and travel about, and to appeal to masses of people, and ask for missionaries to come out to a dangerous country where we lose every year some of our number by disease and death (and this year we have lost four already), and to tell them that we have no advantage to offer, and no inducement but the love of God and the love of souls. We have to tell them, "You will have no emolument. You will get £20 a year for your expenses. Whether you are a priest, or a carpenter, or a blacksmith, or whatever you are, we all get the same. We live together. We share altogether. I have nothing more to offer you." Yes, but upon the supernatural ground on which we rest it is not unreasonable, and the method is a very sifting one. Only those are likely to come and work in such a mission who are moved by the Holy Ghost to come and give themselves to the work.

Then it must be remembered that we are all missionaries—not only the priests—but the carpenter, and the blacksmith, and the printer. The printer is a very valuable missionary. Whether it is the ladies who nurse, or the ladies who teach, or the schoolmaster, or the mechanic, the captain of the vessel, or the engineer, all are on the same footing, recognising one another as missionaries. All are communicants of the Church of England, and they have come because they have a missionary vocation to carry out that particular work which God has taught them, and they do it only for the good of the heathen. . . . When first we formed the plan of having a missionary steamer on Lake Nyasa, it was said by common-sense and business-like men that the plan would certainly fail. It was said that the officers would get drunk or get out of temper with the natives, and it would be a failure. I knew that the experiment had not been tried before on these lines—on the lines that each person on the steamer should come out as a missionary with a missionary vocation. And I have had the satisfaction of late years to hear these very men get up in our committee and say, "I acknowledge that I have entirely changed my opinion. At first I thought that it must be a failure. I acknowledge that the steamer has been a great missionary success."

Then with regard to the way in which we think it right to teach our natives. Our desire is to distinguish very clearly between Christianising and Europeanising. It is not our wish to make the Africans bad caricatures of the Englishmen. What we want is to Christianise them in their own civil and political conditions; to help them to develop a Christian civilisation, suited to their own climate and to their own circumstances. For instance, we do not allow any of the boys in our schools to wear any European clothing. It is not our business to encourage the trade in boots by spoiling the feet of the Africans for their own climate. That seems to be what has caused in the minds of many Englishmen a sort of feeling against

missions, because they see so many people of our poor country whose sole idea of perfection with regard to the things of this life is that they must be as much like Europeans as possible. Very often it only ends in a sort of bad caricature.

Then I would also say that it is very important that the missionary should not wish to draw people around him away from the legitimate authority which is exercised over them. That is the way, surely, to manufacture hypocrites. Everybody who has a grievance against his chief, everybody who has some hope of getting free from rendering feudal service, will gather round the missionary, if he thinks he can be protected, and play off his Christianity against the power of the chiefs who exercise legitimate authority over him. What we want to do is to go to the people living, as I have said, under their own civil and political conditions, and teach them in the midst of those conditions, and Christianise, so far as we can, all classes of the people, from the chief downwards—beginning, of course, if we can, with the chiefs, as being the persons who have the greatest influence in the country. It is said, sometimes, "Why do you not try to teach more trades?" Well, you must remember that if we teach the natives trades which are of no use in the particular country in which they live, it will only end in the missions afterwards, instead of making them independent and letting them get their living for themselves, having to find them work, and keeping them always in a dependent position. When we teach the boys trades, our object is to teach them such trades as shall enable them to live in entire independence of the mission hereafter, and to get their own living in their own country.

And then to turn to deeper things. I am certain that the people of Africa need not so much to be taught an emotional as a disciplining religion. It is not difficult to work upon the emotions of the inhabitants of a tropical country. We may produce, I dare say, a great appearance of outward devotion. I think that some people in England would be surprised if they came to our large school at Zanzibar and saw the devotion of the boys at the time of service; but the fact is that it does not mean nearly so much as it would mean in this country. It is no trouble to an African boy to sit still. It is no trouble to an African to show an appearance of reverence. African boys have not the fidgets as English boys have, and they have not so strong a will to be controlled. What we want is to teach them a religion which will lead them to discipline their lives. Sometimes, when I have heard warmth of expression on the part of those natives who have been brought up differently, I have felt a little sad, as if there was something wanting amongst us; but my common-sense and my experience have always brought me back to this—that we must teach them a religion which will lead them to discipline themselves in the midst of this terrible atmosphere of evil in which their battle lies. Yes, I do not suppose that anybody here in this protected country knows what a battle it is to anyone there in Africa to live a really holy and noble life. We hear of the virtues of the "noble savage." Let anybody who talks about the virtues of the noble savage come and stay in our country, and I think then that he will have to correct those theoretical impressions of his. I think that he would soon have to acknowledge that for any one to live a really Christian life in that country means a much greater battle than most people have to fight amid that Christianised social opinion and those surroundings of protected life which most of us have here. Therefore we have to keep people a long time waiting before we admit them to Christianity. It has generally been supposed that Roman Catholics are very easy in baptizing people, but a French missionary told me the other day that Cardinal Lavigerie, the great head of African missions, had sent out a message that no native was to be baptized under two years' preparation as a catechumen. Well, I have tried something of that kind, and I acknowledge that it is too long; but still there must be a long preparation first to

test their earnestness and sincerity, and then there must be the deepest dealing with individual souls. . . .

The Church must not be depressed to a lower level to meet half-way the heathenism of Africa. The Church must embrace the African, and raise him up by means of her sacraments and means of grace, and spread a network around him and raise him up to her high level, not abating one jot in morality or spirituality of what she requires of her children here at home. Only so, I believe, will there be a truly healthy, living Church in Africa. Then only will she dare, as we are daring, to try to form a native ministry, and to put before each boy who has intellectual capacity, and is leading a high moral life, that that is the life he is to look forward to out of gratitude to God. . . . It should be the highest ambition of his life to take the message of the Holy Gospel to his brethren, and to spend his life in sharing those great blessings which he has received with his brethren, who will remain in heathen darkness if he does not go to teach them. That is what I believe many of our young men have in their hearts; and one day I am quite sure that we shall see an enthusiastic and able (native) ministry extending the work of the Church far and wide in Africa.—*Central Africa.*

SCIENTIFIC HINTS TO MISSIONARIES.

(By the Rev. L. E. BAYNARD KLEIN, D Sc., F.L.S.)

Two or three years ago the eminent Catholic biologist, Rev. Dr. Baynard Klein, Fellow of the Royal University of Ireland, drew up for the use of the Missioners of St. Joseph's Society of Foreign Missions, Mill Hill, a very valuable set of directions for scientific observation in the various lands they are sent to evangelise. These "hints" seem to us so useful for all missionaries, in whatever part of the world they may labour, that we have obtained permission from the editor of *The Illustrated Catholic Missions* to reproduce them in our *Journal*, and trust they may be found of use by many into whose hands these pages may come.

All missionaries are often in a position, without much difficulty or labour to confer great benefits on Science by taking advantage of their special opportunities to make observations, to collect specimens of plants, animals, minerals, fossils, &c., and to note many facts of interest among the races they are evangelising, many of which unfortunately are too rapidly disappearing before the white man. Such scientific observations, if carefully collected and duly forwarded to proper persons in Europe, may be the means of solving very important scientific problems. But in order to observe and collect profitably, some method, some system is required. The following short rules may be found useful for the purpose, in enabling any missionary to know what he should look for where he is, what he should gather, and how he should preserve for transmission to Europe, the things he has been able to collect together:—

I.

GENERAL POINTS TO BE OBSERVED.

The missionary ought to take careful notes, brief but clear, respecting the *customs* of the populations among which he is residing. In particular—

- (a) Ceremonies practised at births.
 Do. do. at weddings.
 Do. do. at burials.
- (b) Modes of trade.
 Special industries.
- (c) Kinds of food.

- (d) Also the language of the people. Their former language, if traces of it exist.
- (e) Songs, legends, superstitions.
- (f) Prevailing diseases of the place. Local remedies.
- (g) Articles of dress and ornamentation (which should be procured and forwarded if possible).
- (h) Good drawings or diagrammatic sketches of houses, carriages, boats, and tombs.
- (i) Specimens of skulls of men, women, and children should be secured, whenever possible. Whole skeletons might be of great importance and even value in Europe, if carefully packed and quite complete. But even fragments are worth something.
- (j) All *rude stone monuments*, dolmens, menhirs, mounds should be carefully explored, and sketched.
- (k) Any fragments of pottery, however rude, should be collected.

N.B.—In the case of all specimens, it must be carefully noted that their value entirely depends, scientifically, upon the accuracy with which in *every* instance record is made—

- (a) Of the place where the object was found.
- (b) The date of discovery.
- (c) The depth, if the object was dug for.
- (d) The approximate height above sea-level, if the object was gathered on the surface of the ground, not on shore or by the river-side.

These details are necessary in every instance, especially in the case of plants, shells, fossils, and minerals.

II.

All information respecting climate, temperature, seasons, prevailing winds, atmospheric pressure, is valuable. An aneroid barometer, a mercurial thermometer, and a compass will enable the missionary to make many easy and important observations.

Thus it is recommended to note down in a book—

1. Every rainy day in the year (total or partial).
2. Every day with continuous sunshine.
3. The direction of the wind.
4. The temperature in the shade and in the sun at noon.
5. The barometrical pressure.

N.B.—All such observations should be accompanied by a description of instruments used, and a statement of the altitude at which observations were made.

III.

Every mine, quarry, natural or artificial section of the ground is worth visiting. There, all minerals should be collected, whether crystals, pieces of the rocks, pieces of coal, or coal-looking substances. Some description of the rocks, of mountain, or level ground from which the specimens were taken should be supplied.

FOSSILS.—Many plants, shells, bones of animals, &c., are often discovered in quarries or rocks, when observed more attentively. These fossils are always of the utmost importance, and as many of them as can be conveniently obtained should be forwarded. Fossil bones are often to be met with in caves, along the banks of rivers, often at a considerable height. They should be taken just as they are in the clay or sand that contains them, and carefully packed in boxes with full indications of the locality. The same remarks apply to all other fossils. Shells should not be rejected because of their similarity to others, as it is difficult, without great experience, to make sure of their identity, and thus some rare and precious specimens might be rejected and lost.

IV.

PLANTS.—Although plants, in European countries, may be divided, not very properly, into rare plants and common plants, no such division is to be admitted for

plants that are found growing in distant and unexplored countries. There *all* plants are of importance, and should be indiscriminately collected. All that is required is that the plants should be dried in paper as soon as possible after being gathered, care being taken that the flower, if possible, be present in each specimen, as well as leaves and roots. Attention is to be paid to the fact that leaves are not always similar on the same plant. Each kind of leaf ought then to be secured. On the double sheet of paper which contains a specimen, the date of discovery, the place, and if possible the hour when gathered, as well as the name of finder, are to be noted. Plants may be divided, for collecting purposes, into the following groups: Marine plants—(algæ). Fresh-water plants—(fresh-water algæ and phanerogams, *i.e.* flowering plants). Land plants—(flowering). Land plants—(flowerless). Among flowering land plants, those that are gathered on *mountains* should have it indicated on their paper, with the altitude, if known. Flowerless plants include ferns, club-foots, mare's-tails, fungi (mushrooms), lichens, and algæ. As the fructification in ferns is often carried on by special fronds, care should be taken that fronds, both fertile and sterile, are secured. It should be mentioned whether the fern is a low herb or tree-like in its proportions. Fungi may be preserved in bottles or tin boxes. Marine algæ are easy enough to fix on paper, but if time is wanting for this, they should be simply washed in fresh water and rolled in a piece of paper when dry, with the usual indications. Only twigs of trees can usually be preserved by the traveller, but it should then be mentioned that they come from a tree of such size, height, &c. Roots of plants should accompany specimens as a rule, but in the case of bulbous plants, the bulb is, of course, indispensable in all cases. It may be found necessary to dry the plant independently of its bulb, but then some accurate means must be devised to secure easy identification of plant and bulb afterwards. *Parasitic plants* are always of great interest. All plants, therefore, seen living on trunks of trees, or generally upon other plants, must be taken, their connection with other plants being carefully indicated.

V.

ANIMALS.—Many specimens of animals are extremely easy to secure and preserve for expedition to Europe. Others require a considerable amount of preparation. But generally speaking much time and trouble can be spared by having ready small casks or tin-cases, in which specimens can be stored in spirit—the only preparation required being to wash the specimens and to free them from dirt, mucosities, &c., before immersing them in alcohol. Fishes are thus very easily preserved, since they merely require washing and placing in alcohol. Birds require more care, and should be roughly stuffed before being packed. Small mammals, reptiles, batrachians, &c., may be treated in alcohol. At least the skeleton and skin of large mammals should be secured. All marine animals may be treated like fishes. Particular attention should be paid to molluscs. The *shells* are always valuable, but the animals contained in the shells should be procured also, if possible. It is sufficient to preserve the molluscs in bottles filled with alcohol. Shells should be washed and then packed in cotton or other soft substance, care being taken that both valves, in the case of bivalves, are well united by a thread. It is usual for Butterflies to place them in little triangles made of strong paper. They can thus easily be packed in boxes and kept there for a long time. The larvæ or Caterpillars should not be overlooked. They are preserved in alcohol. Small Insects don't usually require any special preparation. Echinoderms, star-fishes, all kinds of coral, polyps, medusæ, worms, are all important and only require to be placed in spirit. The preparation for vertebrate animals (Taxidermy) is always done better on the spot, when time allows of it. Those who wish to undertake this task will do well to procure some practical manual of Taxidermy. It is useless, perhaps, to mention that all bottles, cases, &c., should be hermetically sealed

for the voyage, and all due precautions taken against damp. Many specimens are often destroyed on the voyage, owing to the neglect of these precautions.

A PRACTICAL SUGGESTION.—The geographical distribution of the land and freshwater shells of the world is alway interesting to the student of conchology with a geographical bias. The inability of these animals to travel long distances, and their incapacity to fly, provide evidence much more reliable than do other animals in determining the ancient landmarks of the world, and the long or recent separation or otherwise of continents and islands. A knowledge of shells, too, is important to the geologist when reading "The Testimony of the Rocks." It has occurred to me that some of the officers of the Geographical Society might, through their agencies and friends, induce the various missionaries in foreign countries to collect the land and freshwater species, and send them to the various conchological societies and museums in England for study. This might be done to the personal advantage of the missionary himself, or might be useful to him in making himself pleasant and beneficial to the friendly natives, who ought to be encouraged to see a yard of calico or a few snail shells—other things grow beside palm oil and ivory. India-rubber and nutmegs and land shells bring a good price at current rates.—[The name and address of the writer who is willing to help by purchasing a certain number of shells, will be supplied on application to the Secretary.]

TAXATION IN BRITISH CENTRAL AFRICA.

A tax of 6s. per head on all males over fourteen years of age has been collected in a few villages in our immediate neighbourhood here. A message was sent to Kapeni and Matope, but we hear they demur to paying a poll tax, saying they hoed part of the Katunga Matope road. Masea on the lower Shiré River has made a couple of canoes in lieu of the taxes. We hear from Zomba that a similar tax is being collected in the neighbourhood of the Residency.

Some of the villagers near us say that the message brought by the Zanzibari police to them was—"If you don't bring in your taxes at once, we'll come and burn your houses."

All our boarders on the Mission (males) over fourteen years of age have been taxed to the extent of the above sum—scholars, apprentices, school children alike. Our boarders do part work in return for their board and education on the station. Those who are more advanced receive a small wage, but not proportionate to the value of their labour. The number of those who have had to pay taxes is 52. Of these four receive no pay at all, two receive 1s. per month, five receive a rupee (valued 1s. 6d.), nine receive 2s., fifteen receive sums from 2s. 3d. to 3s. 6d., and the others receive various sums ranging up to 12s. per month. All scholars, apprentices, teachers alike, have been taxed to the same value of 6s. per head. A simple sum in compound division will calculate how long these would have had to work at the above rate in order to satisfy this demand. The mission paid for its scholars the sum of £15 12s. to relieve them of this exorbitant imposition.

Failing this all would have had to leave school or their work at the Mission and enrol themselves with the administration for the space of one month—the rate of wages on the Government works being estimated at 6s. a month.

If this enormity is to last we must ask those Sunday Schools and congregations in Scotland who pay £3 per annum for the support and training of a boy over fourteen years to increase their contribution by the amount of 6s., in order to pay their *protégé's* taxes.

The tax was collected hereabouts in produce, money, or labour. Six baskets of maize are accepted as equivalent to 6s. We have bought maize this season at from 4d. to 6d. a basket—the ordinary price used to be 3d. Labour on the Government works is estimated at 6s. a month. The standard rate of wages paid all over the Shiré Highlands is 3s. per month for ordinary labour. Here is a strong inducement held out to the ordinary steady labourer at a station or plantation to desert his usual work, for which he is paid 3s. per month, and enroll himself elsewhere, where his month's work will be estimated at 6s. The effect of this fictitious estimate of prices and wages on the trade and labour of the country it is needless to point out.

Let us compare this 6s. poll tax on males over fourteen years of age with taxation in other countries situated in circumstances somewhat similar to our own.

In the Cape Colony the tax on natives is fixed at 10s. per hut, so that a man who has but one hut pays only that sum for himself, his wife, and family. Wages at the Cape are estimated at about 1s. 6d. per day for casual labour, or 20s. per month for a constant wage. A man can thus clear off his hut tax for himself and family by a payment of 4·16 per cent of his fixed income, or by working for seven days at the usual casual labour rate.

In Burmah, a country conquered by British arms, and one of the richest and most fertile in the world, males between sixteen and sixty years of age are subject to taxation, and women when they carry on an independent business separate from their husbands. The tax is fixed at the rate of $2\frac{1}{4}$ to $2\frac{1}{2}$ per cent of their annual income. Rich natives pay consequently more than the poor. In the case of the latter the income is estimated at 120 rupees per annum, the average rate of wages being 10 rupees per month. This at $2\frac{1}{4}$ per cent gives $2\frac{3}{4}$ rupees (or a little over 3s. exchange with Europe) as a native annual tax. And this in a country where wages are 10 rupees per month!

In the Portuguese colonies on the lower Zambezi, usually looked upon as examples of extortionate taxation, the tax is a hut tax of 4 rupees and 8 pence, or rather it is a tax of 2 rupees and 4 pence on a man who possesses a hut, and a similar sum on his wife. No unmarried people are taxed, only the owners of huts. Thus a sum of 6s. 8d. pays taxes for a man and his family for one year. The average wage is 4 rupees a month. Suppose a man has a wife and three sons over fourteen years but unmarried. To the Portuguese he pays 6s. 8d. per annum or its equivalent in a month's labour for himself and family. In British Central Africa the amount paid by such a family would be 24s. per annum. Had the people living at the Blantyre Mission been estimated at the Portuguese rate, the amount paid by us would have been £3 (nine householders at 6s. 8d.), instead of the £15 12s. which we have paid.

In addition to these there is in each of these cases indirect taxation, such as custom duties, import dues; in Burmah a tax on salt; in British Central Africa a gun tax of 4s. per annum, etc.

In 1889, when those treaties were being signed as a foil against the Portuguese, there was much talk then on the part of the English residents in the country regarding the Portuguese taxation, and comparing that nation with the English, who did not impose taxes. The natives here vividly remember all that passed then, and accuse us of a breach of faith with them in this imposition of taxation.

One might add a comparison of the above with certain districts of India where the inhabitants are an agricultural people, and derive their means of subsistence, as here, chiefly from the soil. In lower Bengal, for example, the land is in the hands of the Zemindar or landowner, or is claimed by Government as Crown land. According to time-honoured usage the native pays rent for his land as a rule about 4s. 6d. per acre. This in an ordinary year will yield him a return of 40s. In addition to this he pays from 3s. to 5s. of taxes per annum for himself and family into the Government treasury. This tax, however, was only imposed after Government had spent thousands of pounds sterling in making roads, bridges, etc., which enabled the tenant to dispose of his produce at the best market.

Wages are on an average for a man 9s., for a woman 6s., and for a boy or girl 4s. or 5s. per month. Thus a man can work on any of the plantations in his neighbourhood for a month, and get as much as pay rent for a couple of acres yielding a return of 80s. The rest of the year is free for labour on his own ground or elsewhere both for himself and other members of his family. The total sum paid by the family by way of rent and taxes per annum amounts to from 12s. to 14s. And this in the most civilised country outside of Europe!—*Life and Work in British Central Africa.*

The 232nd Meeting of the Society held at Cotton Waste Exchange, Saturday, December 31st, 1892, at 5 p.m. The Rev. S. A. STEINTHAL in the chair.

The children of members were received by the Victorians, who had prepared a geographical lantern show. Games were played and there was a distribution of Japanese dolls and toys. Through the kindness of one of the members, Mr. Le Mare entertained the children with legerdemain, shadow pictures, and the immortal Punch and Judy. Music was rendered by some of the young ladies present. The meeting was thoroughly enjoyed by the young people who thanked all those who had helped to make the gathering so great a success.

THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

ASTRONOMY IN RELATION TO GEOGRAPHY.

By MR. THOMAS WEIR, Hon. Sec. N.W. Branch, British Astronomical Association.

[Addressed to the Members, in the Memorial Hall, Wednesday, October 7th, 1891, and repeated (by request) at the Schiller Anstalt, Nelson Street, Tuesday, January 26th, 1892.]

THAT the several departments of knowledge designated the Sciences do not stand apart, but are largely inter-dependent, is evident on even a casual survey, and in this respect Astronomy is by no means an exception. Mathematics, Geology, Geography, Chemistry, and Photography have all lent their aid to its development, and whilst to some of these Astronomy may appear to have rendered little in return, this cannot be said with regard to Geography. On the contrary, these two sciences have an intimate relation, and our more immediate purpose is to consider some of those points of association, supplementing our remarks by illustration and experiment.

Before entering upon our subject, however, let us endeavour to comprehend in some slight degree the magnitude and position of the Earth in relation to some of the orbs around it, for, from what may charitably be termed a natural partiality, we are inclined to regard our planet as the chief object in the universe and to imagine that all the others have been formed to minister to its requirements.

Reference was here made to a diagram representing the Sun and planets of our system to a scale of 1 in. to 20,000 miles, the Sun, which is 866,400 miles in diameter, being represented over 3 ft. 7 in.; whilst Earth, whose diameter is 7,926 miles, was less than half an inch in size. It is, of course, impracticable to

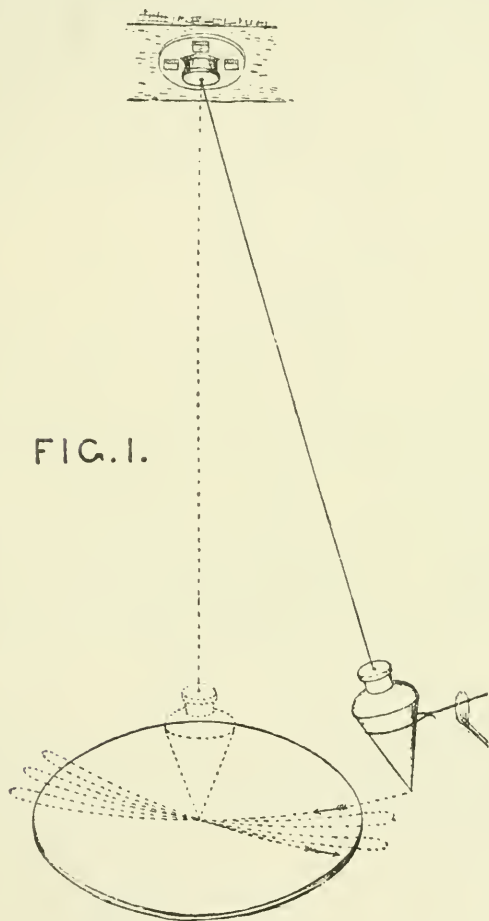
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reproduce a drawing like this with the *Journal*; but it is only when represented on a large scale and in their true proportions that we can comprehend the vastness of our central orb in comparison with any or all of the planets encircling it, and when so considered the mind is assisted to an easier comprehension of the Sun's transcendent magnitude and influence. In the absence of a large scale drawing, two familiar illustrations might be presented—one to illustrate the Sun's size, and the other the relative sizes of the Sun and Earth. With regard to the former, let us take as a basis the mean distance of the Moon from the Earth—238,000 miles—and the diameter of its orbit, considered in relation to our planet, is, of course, double this distance, or 476,000 miles; but were the Sun only this size it would be a comparatively insignificant object, and the light and heat received from it would be less than one-third what we now experience. The Sun's diameter is really almost double the diameter of the Moon's orbit, and how immense then is its size. As to the relative dimensions of the Sun and Earth, it may assist us to a faint apprehension of their proportions if we suppose for a moment a person capable of travelling around the former at the rate of a mile per minute, when one circuit at its equator would be found to occupy no less than 5 years and 64 days of our time, whilst a similar rate of speed would take our supposed traveller round the Earth in little more than 17 days.

Of the eight planets known to acknowledge the Sun as their ruler, Earth is the third in distance and the fifth in size. It is but a minute object amid the celestial orbs, but notwithstanding its insignificance in this respect it provides for the geographer an interminable fund of interest in the exploration of its surface, whilst to the astronomer it forms a station for conducting his yet grander researches into the universe itself.

The opinions held by the Ancients regarding the Earth's form were both diversified and numerous; but it is Anaximander, of Miletus, astronomer and geographer, born 610 B.C., who is generally accredited with the first expression of the idea that the Earth is a round body isolated in space. Numerous proofs of the Earth's form are now familiar to us, which, however, were either unknown or not understood in Anaximander's day. The curved surface of the sea had most likely been observed, but to make a circuit of the Earth—now a matter of common occurrence—affords an ampler evidence, whilst the science of navigation is based on the supposition of the Earth's globular form. The fact that the Sun can be seen from the summits of mountains after it has disappeared from the view of those less elevated; the outline of the Earth's shadow upon the Moon when the latter is partially eclipsed; the form of the Sun's image as reflected at rising or setting on the still surface of the sea; and then, again, the fact that in travelling northward from

the equator we observe those stars which nightly descended below the horizon remain above it. By continuing our journey we can reach a position where, at midsummer, the Sun remains in view for several days in succession, and this circumstance, together with the knowledge of its annual recurrence, not only proves the Earth to be round, and that it has a diurnal rotation,



but also that the Earth must move in an orbit about the Sun, and that its axis of rotation is not perpendicular to its path.

Proofs of the Earth's rotation are to be found in the fall of a body from any considerable height, for it will be obvious that the summit of a lofty tower must travel at a greater rate from west to east than at the base, as being more distant from the Earth's centre, and the body so falling will be projected eastward by the

greater velocity of its starting point. Repeated trials of such an experiment were made near Freyburgh, in Germany, where a heavy ball was let fall down a pit-shaft 520ft. in depth, and a mean of several results carefully measured showed that the ball had been projected eastward $1\frac{1}{10}$ in., which is within the $\frac{1}{10}$ th part of the distance obtained from calculation. Perhaps the most interesting demonstration of the Earth's rotation is the pendulum experiment, originated in 1849 by the French physicist, M. Leon Foucault. The principle on which the proof is based is that a free pendulum will continue to move in the plane of its initial motion regardless of the rotation of its point of suspension. Its application will be most readily understood if we consider what would occur were such a pendulum suspended over either of the poles. Once in motion it is clear that its swing would continue in an unvarying direction—say that of a star—and the Earth meanwhile revolving, the pendulum would *appear* to move round by increments, and to make a circuit in 24 hours; whereas the actual fact would be that the Earth would perform a revolution under the pendulum in the opposite direction. Over the North Pole the *apparent* movement of the pendulum would correspond in direction with the hands of a watch; over the South Pole the pendulum would *appear* to move in the opposite direction; whilst at the equator there would be no movement either way. Between the poles and equator the time of an apparent revolution of the pendulum increases, of course, as the latitude of the place decreases, and at the latitude of Manchester it would take almost 30 hours, the calculated motion being $12\cdot09^\circ$ hourly. The experiment—somewhat critical owing to the influence of air-currents—was performed in the hall (as represented in Fig. 1), when a plummet 40lb. in weight was suspended by a wire from an attachment at the ceiling, and in half an hour after being liberated the deviation, as shown by a line previously drawn on the floor, was clearly discernible. A repetition of the trial was made with like result. The experiment has been conducted under conditions most favourable for securing accuracy at the under-mentioned places, and the results are put on record by the South Kensington authorities, as follows:—

	Latitude.	Observed motion in an hour.	Calculated motion in an hour.
Ceylon	$6^\circ 56'$	$1\cdot87^\circ$	$1\cdot815^\circ$
Paris	$48^\circ 50'$	$11\cdot5^\circ$	$11\cdot323^\circ$
Bristol	$51^\circ 27'$	$11\cdot788^\circ$	$11\cdot763^\circ$
Dublin	$53^\circ 20'$	$11\cdot915^\circ$	$12\cdot065^\circ$
Aberdeen	$57^\circ 9'$	$12\cdot7^\circ$	$12\cdot636^\circ$

The idea of the Earth's round form seems to have been generally accepted by the learned from the time of Anaximander, and a strong desire possessed the minds of succeeding philosophers to obtain proof of the fact, as well as to ascertain the

Earth's size. It was not, however, until about 220 B.C. that a method, remarkable both for its simplicity and accuracy, occurred to Eratosthenes, of Alexandria. This philosopher, distinguished alike as mathematician, astronomer, and geographer, had observed that at noon on the day when the Sun reached its greatest altitude, it was exactly overhead at Syene (now Assouan), in Upper Egypt; whilst at Alexandria—which was considered to be due north from Syene—it was to the southward of the zenith by one-fiftieth part of the circumference of the heavens. The divergence was rightly assumed by Eratosthenes to be due to the Earth's form and difference in latitude of the two cities, and it occurred to him that if the actual distance between Syene and Alexandria were known, the circumference of the Earth might

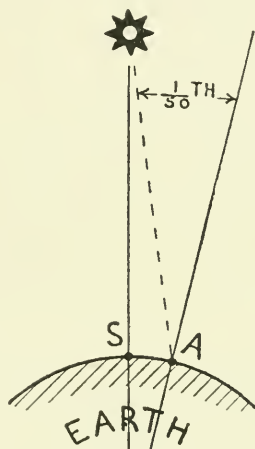


FIG. 2.

be ascertained. The distance was measured and found to be 5,000 stadia, making the Earth's circumference 250,000 stadia, equalling 28,279 English miles,* or a diameter of 9,001 miles. This is 1,075 miles more than the measure now accepted.

In the accompanying figure (Fig. 2) S and A indicate the positions of Syene and Alexandria respectively: the zeniths of the two places are represented by the extension of the lines through S and A, and the Sun over Syene by the star-shaped figure.

Such is the story of the earliest measurement of the Earth, and, in addition to a belief in its globular form, it will be noted that Eratosthenes must have considered the Sun to be at an immense distance from the Earth, a fact not generally admitted by the learned of his time.

* "Star-gazing, Past and Present." By J. N. Lockyer, F.R.S.

The principle on which the Earth's diameter was computed by Eratosthenes is the same as that still employed, it being by celestial, conjoined with terrestrial, measurements that its present form as well as size is ascertained. Observations both numerous and accurate have been made to obtain the exact value of a degree on the Earth's surface, and between 1670 and 1820 nearly thirty such measurements were taken, some embracing several degrees. The most extensive—and that reaching furthest north—is the Russian arc, terminating in Norway. It comprises an amplitude of $25\frac{1}{2}^{\circ}$; was commenced in 1816, and completed in 1852. The most southerly arc yet measured is at the Cape of Good Hope, which was accomplished in 1848, and is $3\frac{1}{2}^{\circ}$ in length. From these and other such measurements it is found that, whilst at the equator the length of a degree is 363,000ft., its value increases as we proceed towards the poles, showing that the curvature in this direction corresponds with that of a larger circle, or, in other words, that the Earth is flattened towards the poles. It was calculated by Newton that the Earth, revolving at its present speed and cooling from a semi-fluid state, would swell out equatorially and contract in polar direction to a difference in diameter of $34\frac{1}{2}$ miles. More correct knowledge of its density has since been acquired, however, in addition to which the measurements referred to have been taken, and the following determinations, arrived at by the late Astronomer Royal, Sir G. B. Airy, are the most recent and authentic:—

	Miles.
Polar diameter	7,899.17
Equatorial diameter.....	7,925.64
Absolute difference	26.47

It has further been considered, from investigations made by General Schubert and Colonel A. R. Clarke, that the Earth is not quite circular at the equator, but that at the meridian, $13^{\circ} 58'$ east of Greenwich, it is there one mile greater than in a transverse direction. The figure of the Earth may, therefore, be described as an ellipsoid of slightly irregular form, although it resembles a perfect sphere so closely that, if we suppose the greatest equatorial diameter to be represented by the thickness of a volume with 300 leaves, its polar diameter would be proportionately represented in the reduction of the thickness by the removal of a single leaf.

It may not be out of place at this point to enumerate the movements to which the Earth is subjected. They are: (*a*) its diurnal rotation, with axis at present inclined $23^{\circ} 27' 11''$ (the inclination decreasing at the rate of $46''$ in 100 years); (*b*) its annual motion round the Sun in orbit slightly elliptical; (*c*) rotation of the polar axis about the pole of the ecliptic in an estimated period of something like 20,900 years; (*d*) its obliquely

onward motion in space, together with the Sun and other members of the system, so that the orbital path of the Earth is not repeated, but takes a spiral form. Slight disturbance is also caused to the Earth's motion from the varying attraction of the Sun and Moon on the larger diameter at the equator; and in the interval between reading this paper and its publication in the *Journal* still another movement has been detected by Mr. S. C. Chandler, Cambridge, U.S.A. It is that the astronomical axis of the Earth and the geographical—or axis of form—are not coincident, but some thirty feet apart at the poles, and that the latter axis revolves about the former in a west to east direction, making a revolution in about 14 months.

When desirous of determining the position of a place on the Earth the geographer has recourse to the Science of Astronomy. Of the co-ordinates used, latitude is reckoned from the equator in the direction of either pole, and longitude east or west from some selected place. Cadiz, the Isle of Teneriffe, and Paris have thus been or are still employed, but the prime meridian now most generally recognised is that which passes through the centre of the object glass of the transit circle of the Royal Observatory at Greenwich. The Earth's diurnal rotation affords a direct basis for ascertaining the longitude of any place, for it will be obvious that if Greenwich time be known and a comparison made with local time, the longitude east or west from Greenwich can readily be deduced; and it will be equally clear that the difference in longitude of any two places can be known if the difference in time of the transit of the Sun or a star over the meridian of the places be ascertained.

The latitude of a place may be known by deducting from 90° the distance (also in degrees) from the celestial pole to the zenith of the observer, the complement being the latitude; or, again, the altitude of the celestial pole from the horizon of the observer equals the latitude of his position. This admits of simple geometrical proof, as may be seen on reference to Fig. 3, where P indicates the polar axis of the Earth, E the equator, and O the position of an observer, but as the semi-diameter of the Earth is as the thickness of a line, *i.e.*, is perfectly insensible in relation to the distance of the stars, let his position be transferred to C, with Z the zenith and H the horizon. P C E and Z C H are respectively right angles, and if the angle Z C P be taken from each there remains the two equal angles E C Z and P C H, the former of which is the latitude of the observer, and the latter the altitude of the celestial pole from his horizon.

The expressions "longitude" and "latitude," meaning respectively length and breadth, recall to mind a condition of geographical knowledge when it was considered that the form of the Earth could be so described, and in the division of the circle into 360 parts, or degrees, we have likewise the recollection of a

very early attempt at determining the number of days constituting a year.

Measurements of latitude and longitude are also employed in defining positions of celestial objects, but those more generally adopted, and corresponding with terrestrial latitude and longitude, are termed declination and right ascension. The former measurement (declination) is made north or south of an imaginary line representing the projection of the terrestrial equator to the starry sphere, and the latter (right ascension) along the celestial equator beginning at the great circle passing through the poles and vernal equinox. Right ascension, unlike terrestrial longitude, is measured in one direction only; beginning at 0 it runs on to 360° , and we may remark that, in our opinion, it would have been better, despite some inconveniences, had

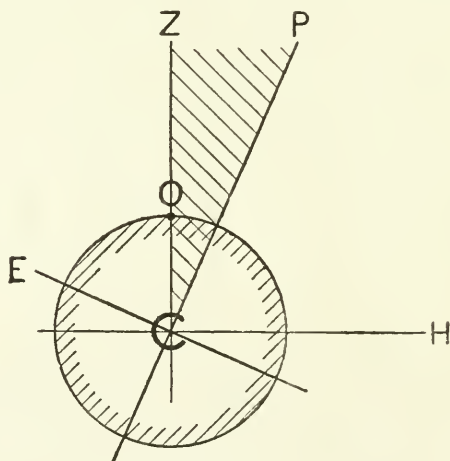


FIG. 3.

terrestrial longitude been originally measured in the same way: it would certainly have had some advantages over the present system. There is still another method of defining the position of an object in the heavens, namely by altitude and azimuth, the former being its direction from the horizon towards the zenith, and the latter the angle between any prominent star and the object, or between the meridian of the observer and the object whose position is sought to be defined. The method receives illustration in the instrument shown in Fig. 4, which represents a quadrant used towards the close of the sixteenth century by the Danish astronomer, Tycho Brahe, and it must have been one of the most serviceable in his extensive collection. The azimuth circle is divided into degrees, numbered from 0 to 180 in either direction from a central line, but the altitude

quadrant is subdivided to 10 minutes of arc, or sixth parts of a degree. The frame carrying the altitude quadrant turns in a socket at its lower end, where it has four cross-arms for additional guidance, and one of these, the hinder one to the right side in the engraving—which it will be observed is in line with the face of the quadrant—forms the pointer for azimuth direction: upon the altitude quadrant is pivoted the bar carrying

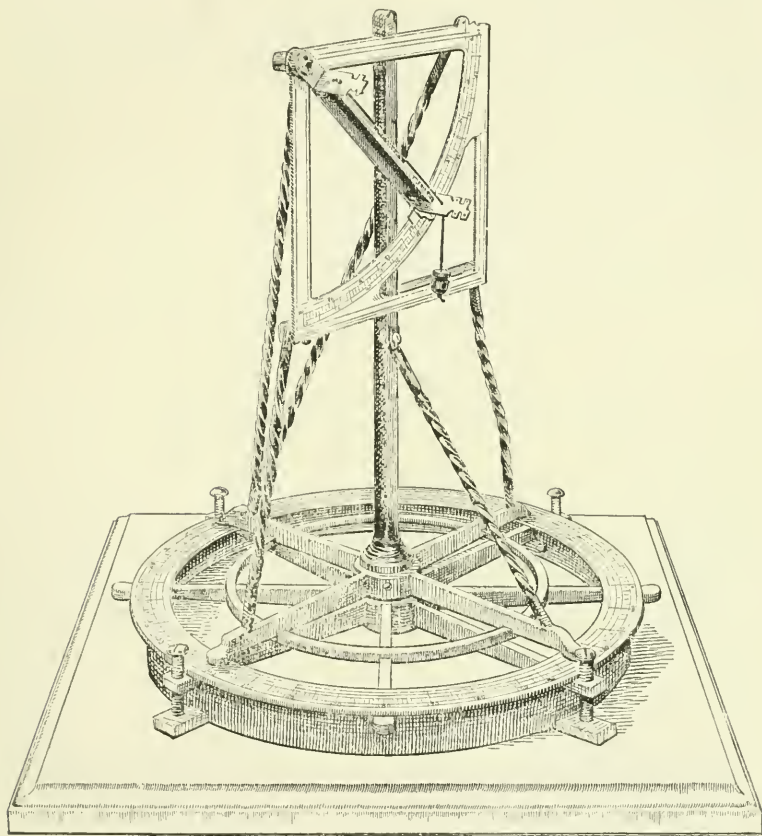


FIG. 4.—TYCHO BRAHE'S QUADRANT.

(From a photograph of a half-size model, constructed from data taken by permission of the South Kensington authorities. The engraving is about $\frac{1}{12}$ th the size of the original instrument.)

the sights. When about to use the instrument the central line of the azimuth circle is brought to coincide with the meridian of the place, and the instrument is then levelled to the plummet attached to the sights, the bar having been previously brought to the zenith position: the finer adjustments are effected by means of the screws seen at the base. To take the position of

an object the observer has simply to turn the quadrant in azimuth and raise the sight-bar until the object is in line with the sights, when its altitude from the horizon, or distance from the zenith if preferred, together with its distance in azimuth east or west from the meridian, can at once be read. This instrument, exceedingly simple and surprisingly effective, is specially interesting to geographers from the fact that the more minute division of the altitude quadrant goes to show that it was specially used for taking altitude measurements, and as it was one of Tycho Brahe's largest portable instruments of the type, it would, in all probability, be employed in determining the latitudes of the places visited by him.



Even the half-size model is capable of interesting work in the hands of one unaccustomed to instruments of the kind, and, as an illustration, the relative positions of the seven stars in the familiar constellation, Ursa Major, taken with the instrument and plotted to a scale of one inch to a degree, were shown. The group of stars, popularly known as the Plough and Charles' Wain, is reproduced on a small scale in Fig. 5, and, as every geographer knows, the pole-star is to be found almost in line with the two specifically termed the pointers, and at a distance about six times the space between them, in whatever direction the group may be turned. The actual position of the pole is indicated in the engraving by a cross.

By the aid of his instruments, Tycho Brahe constructed extensive charts and catalogues, in which he defined the position of the stars with great accuracy; and, in his life of this eminent man, Sir David Brewster remarks: "As a practical astronomer, Tycho has not been surpassed by any observer of ancient or of modern times. The splendour and number of his instruments, the ingenuity which he exhibited in inventing new ones, . . . and his skill and assiduity as an observer, have given a character to his labours and a value to his observations which will be appreciated to the latest posterity."

He died in October, 1601, and the eminent Italian philosopher, Galileo, or with the addition of the family name Galileo Galilei, made his first telescope in January, 1609. This instrument, which in one form or other is so serviceable to the geographer, navigator, or traveller, is of supreme importance to the astronomer. It is difficult to realise the impetus that was given to research by its invention, and that a new era in the science was clearly apprehended is shown by the apostrophe addressed to one of the earliest telescopes by John Kepler, the friend of Tycho Brahe and Galileo, who wrote—

"O, telescope,
Instrument of much knowledge,
More precious than any sceptre! Is not he who holds
Thee in his hand made king and lord of the works of God.
Truly, all that is overhead, the mighty orbs
With all their motions thou dost subjugate
To man's intelligence."

Amongst the earliest discoveries attending the application of the telescope was one which has been of special importance to navigators and geographers. We refer to the Moons of Jupiter (considered to be four in number from their discovery by Galileo until September 9th, 1892, when Prof. E. E. Barnard, at the Lick Observatory, California, discovered a fifth) and to the use made of the rapid changes they undergo in their orbits. It is said that Galileo, with the perspicuity of mind which among other qualifications characterised him, discerned that these changes would serve as a signal to different places on the Earth, and that by computing and publishing the times in advance, the local time of two or more places could be compared at the instant of a specific phase, and the relative longitudes of the places ascertained thereby. The publication of these phases still forms one of the features of the Nautical Almanac, and the precise second when a satellite enters or emerges from the shadow of its primary is published some four years in advance.

Galileo's instruments, as preserved at the Royal Institute, Florence, are represented in Fig. 6. The upper telescope had an object glass about two inches diameter, and is supposed to have been that generally used by him. The lower one is slightly

smaller, while beneath these instruments, in a richly-carved ivory frame, is the broken object glass of the telescope through which the satellites of Jupiter were first beheld. Galileo's most powerful telescope magnified about thirty times, and he viewed the Moon as though it were at a distance of 8,000 miles. The

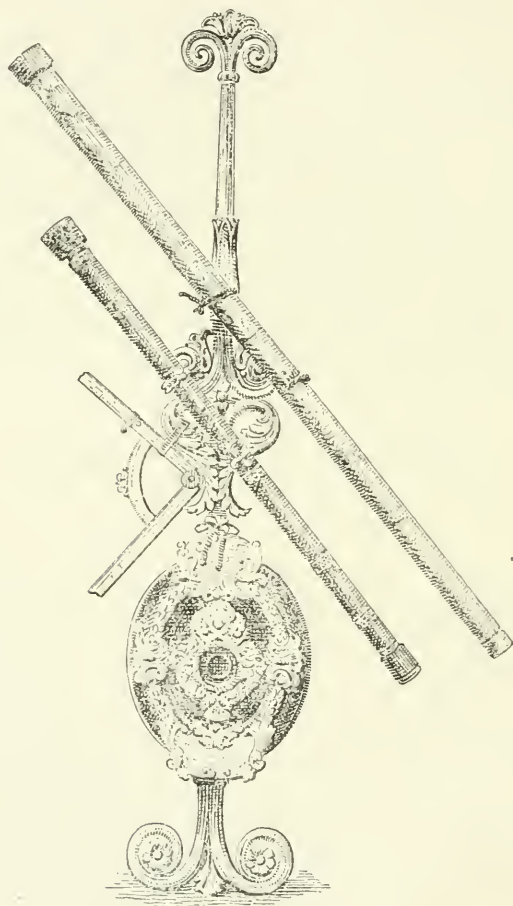


FIG. 6.—GALILEO'S INSTRUMENTS.

(From a photograph, by courtesy of the Royal Institute, Florence, and the Italian Consul, Chevalier R. Froehlich, Manchester. The engraving is about $\frac{1}{12}$ th the size of the original instruments.)

most powerful modern telescope is that at the Lick Observatory, California, the object glass of which is 36ins. diameter, and magnifying power so great that the Moon is observed as if only 240 miles distant. From this may be gathered the vast improvement effected in the facilities for astronomical observation.

By the aid of the telescope the features of some of the planetary orbs have been marvellously revealed to us. The impression produced on the unassisted vision, that, in revolving about the Earth, the Moon keeps the same side constantly turned towards it, is confirmed; and it follows that an axial revolution of the Moon must take place in the same period as it occupies in going round the Earth. This circumstance—due either to its form or to the greater density of the side nearest to us—prevents our becoming acquainted with but little more than half the Moon's surface, and it will further be observed that the length of the lunar day and night is determined by its monthly circuit. The varying degrees of brilliance observed in the Moon are due to the presence of mountains, plains, and valleys; whilst numerous craters scattered over its surface indicate that volcanic action must have been at one time prevalent. Some of the plains, from their darker hue, suggest the idea of their having been at a remote period covered with water. The mountains are generally of a jagged and precipitous form, and rise in some instances to an altitude equal to the greatest elevations on our world. Several circular formations and craters are, moreover, of immense diameter, and the latter of great depth; whilst, in numerous instances, the presence of a central cone indicates the point of latest eruption. There is now no water on the Moon, or otherwise clouds would be observed in its neighbourhood; and it is also without atmosphere, or the sunlight would be reflected into the valleys with the effect of softening the shades, and from the absence of air and water, together with the great difference in temperature that must occur between a lunar day and night, it is inferred that life cannot exist there.

On turning the telescope to Venus, it would appear that all the conditions necessary to life are present. This planet's year is about two-thirds the length of ours, its day—according to some observers—is about forty minutes shorter than our day, and its axis of diurnal rotation is inclined. It has, apparently, lofty mountains, and there is evidence of an atmosphere which is manifested by clouds or vapours, the splendour of the planet being partially attributable to the high reflective power of its cloud-laden atmosphere.

Mars also resembles Earth in many respects, and, being more favourably situated for observation than Venus, drawings and models with numerous details have been produced. Its year is almost double the length of a terrestrial one, and its day about half-an-hour longer, while the axial inclination provides for successive seasons, and the surface of the planet comprises both land and water, forming continents, islands, oceans, and seas, as with us. An atmosphere is also existent, and what appears to be an accumulation of snow has been seen about the polar regions, which has subsequently been diminished on coming

within the more direct influence of the Sun. The general temperature of Mars will, other circumstances being equal, be much lower than that of Earth, but otherwise it would appear that the conditions of existence there will not differ greatly from those we experience.

Less is known regarding the other members of our system—of Mercury on account of its nearness to the Sun, and of Uranus and Neptune by reason of their remoteness, whilst with regard to Jupiter and Saturn—each of which is the centre of a system, the former with five and the latter with eight encircling luminaries—it is more probable that they are themselves minor Suns, shedding light and heat on their attendant orbs.

In conclusion, and almost in a sentence, we will refer to the work being done at the Royal Observatory, Greenwich, in the direction of geographical science, for although there is no separate department, yet much that is done there tends necessarily to the perfection of geographical knowledge. With the spectroscopic and photographic operations we have here nothing to do, but the importance of accurate timekeeping for the determination of longitude at distant stations and by ships at sea is apparent, and it should not be forgotten that the main purpose of the establishment of the Observatory, dating from 1675, was to ensure correct time for longitude determinations. In addition to the distribution of time by electricity and by signalling, with which we are acquainted, there are always at the Observatory a large number of ship's chronometers in course of being tested, and from six to eight hundred are annually dealt with. The greater proportion of these are for use in the royal navy, but occasionally work of this kind is done for other governments than our own.

Observations of the Sun, Moon, Planets, and Stars engage the constant attention of a number of the staff, and several thousands of such observations are yearly made. The importance of this work and its geographical value will be apprehended when it is borne in mind that the data thus obtained forms the basis for the tables of the "Nautical Almanac."

Registration by photographic medium is made of all magnetic change or disturbance, and the mean declinations of the compass-needle at Greenwich, for the years 1891 and 1892, were respectively $17^{\circ} 23'$ and $17^{\circ} 18'$ west of the astronomical or true north. This value differs slightly in places east or west of Greenwich, being less easterly and greater in westerly direction. The declination is subject to an annual decrease of $5'$ to $6'$; the needle having also daily fluctuations, attaining its greatest eastward error about 1 a.m. and westward about 1 p.m., registering the mean positions about 10 a.m. and 6 p.m. These variations are greater when spots on the Sun are more numerous, and less when they are few or altogether absent, and a definite

relation has been determined between the *mean* number of sun-spots and the *mean* magnetic variation. But, though occasional very large sunspots are accompanied by very violent magnetic disturbances, the minor changes on the solar surface and of the magnetic movements have not as yet been shown to have any precise connection with each other.

A re-determination of the difference in longitude between Paris and Greenwich has for some time been engaging the attention of astronomers on both sides of the Channel, and has now been completed, with the result that the difference in time between the transit of a star over the meridian instrument at the Paris Observatory and the Greenwich transit circle is $9^{\circ} 20' 82''$, equalling a longitude of $2^{\circ} 20' 12.3''$, a slightly different result from that formerly computed. A determination of the exact longitudes of Waterville and Montreal, in relation to Greenwich, is about to be taken in hand.

Thus, by the aid of Geography and Astronomy, either conjointly or each in its separate sphere, the sum of our knowledge is ever being increased.

Commercial Geography of Japan.—At the meeting of the Geographical Society of Berlin of February 6th, 1892, Dr. K. Rathgen spoke upon the commercial and economical condition of Japan. He dwelt upon the influence which the orographical features of the country exercised upon the cultivation of the soil, the distribution of the population, and on the commercial routes. The coasts of Japan are more deficient in good harbours, especially for larger vessels, than is generally supposed. This is particularly the case in the north. The whole west and north-west coasts are as good as harbourless. The cost of land transport is very high. Dr. Rathgen gave some interesting facts with regard to commerce by sea, and as to the railways of the country. The improved facilities for commerce have led to great displacements of the population. This is shown by the fact that the two large cities of Yokohama, with 120,000 inhabitants, and Kobe with 140,000, were thirty years ago mere fishing villages. Centralisation is the characteristic feature of modern Japan.—*Proceedings of the Royal Geographical Society.*

Explorations in Caucasia.—The Russian *Official Messenger* (April 22nd) announces that the Ministry of Domain has decided to make, next summer, the following explorations in Caucasia:—(1) The exploration of the mineral springs of the Eastern Caucasus having now been completed, to carry out a similar work in Central and West Transcaucasia; namely, the mineral waters of Khvedur, Uravel, Tsikuban, Platen, and others, in the governments of Tiflis and Kutais, and in the Chernomorsk District; (2) to continue the systematic geological exploration of the government of Tiflis, especially of the valleys of the Yora and the Alazan in Kahetia, and their mineral resources, in view of the projected construction of a railway in Kahetia; and (3) as the detailed study of the Apsheon naphtha region was terminated last year, and the map of the region is ready, to complete the exploration of the Caspian coast naphtha region, and to explore the nickel ores of Daghestan. The geologist Simonovich and the mining officers Konshin, Barbot-de-Marny, and Gavriloff, are commissioned for this purpose, while M. Rughevich is commissioned to explore the naphtha region along the new Petrovsk branch of the Vladikavkaz railway, which yielded last year 15,000 tons of naphtha, and promises to become an important centre of naphtha industry.—*Proceedings of the Royal Geographical Society.*

GEOLOGY IN RELATION TO GEOGRAPHY.

BY PROFESSOR W. BOYD DAWKINS, M.A., F.R.S.

[Addressed to the Members, in the Large Room of the Chamber of Commerce,
February 8th, 1893.]

PROFESSOR DAWKINS said: If he were asked to define Geology in the shortest possible way, he would say it was the history of past surfaces of the earth. And if he had to define Geography in the same way, he would define it simply as the history of the present surface of the earth. In the light of these two definitions it was clear that one could not grasp the true principles of geographical form and outline and geographical inquiry in general without knowing something of the causes by which the present surface of the earth had come to be what it is. If, within the limits of a single lecture, he were to try to indicate one-thousandth part of what Geology had to say regarding the present surface of the earth, he should do an injustice both to Geography and to Geology. He therefore proposed to take only a few points to illustrate the intimate connection which exists between the ancient earth as we know it from a geological point of view, and the surface of the earth as we know it now.

If they tried to get an idea from the ordinary geographical text-books as to what a mountain is, it would come very much to this—that a mountain was a mass of material, dropped down somehow or another on the surface of the earth so as to form a barrier between two sets of people, and that it also had something to do with the direction of rivers. Well, he need not say that this was not a quite satisfactory account of the matter; and he proposed to say something about mountains from the geologist's point of view. In the first place, as to the structure of mountains. For purposes of illustration he took the Pennine chain, which forms a great arch with the Lincolnshire plain on one side and the flat land about Manchester on the other. This arch consists of limestone, 5,000ft. in thickness, and above the limestone shale beds and sandstone. The arch arrangement is carried through until we find, on the Manchester side and on the Lincolnshire side, the coal measures cropping out of the flanks of the chain. The history of the Pennine chain was simply this, that in the first place the rocks had been folded

along a north and south line, and that the upper part of the fold had been worn away by rain, rivers, frost, and the other agencies which attack the surface of the earth above water.

How did the folding come about? It was the simplest thing in the world. The earth is a cooling body, and all cooling bodies contract; and the earth is contracting through the surface into a series of folds. It was as if one took a piece of thick cardboard and folded it in the shape of an arch. The outer surface of the creases was weakened because the particles of paper were separated from one another. At the same time, the inner surface had its particles compressed together. So the rocks in being folded had opened out at the tops of the ridges, and in this way had become weaker, and in course of time had been worn away. Geologists, of course, were fortunate in having, as Professor Huxley put it, an unlimited credit on the bank of time. With a few exceptions, the history of the Pennine chain was the history of all the important mountain ranges. In further illustration of his theory, Professor Dawkins spoke of the structure of Snowdon and the Rocky Mountains in the British part of North America. He proceeded to say that if we wanted to fix the age of the Pennine chain it was easy enough to do so by an examination of the rocks that had participated in the folding of which he had spoken. The same principle held good with regard to the Alps or the Pyrenees. If one grasped the fact that the surface of the earth was composed of a series of rocks which had been deposited in a definite order, and mostly parallel to the surface of the water, he had the facts before him for determining the age of any mountain chain. Of course the mountains had changed most wonderfully since that time. All the agencies of change had been continually at work upon them. At the same time, we must believe that there were great periods in mountain-making, and one of these was the interval which divides the miocene from the pliocene. Another point noticeable in mountain chains was this—that the hardest rock stood best. If one took a piece of sand-paper and rubbed the leg of a table the knots would resist the friction better than the softer wood surrounding them. So it was with mountains. One portion of a mass of rock harder than the rest would stand out when the surrounding rock would be worn away. A notable example of this was furnished by Mont Blanc.

The Professor drew a diagram to show how mountain peaks and passes were formed by the working of torrents against each other. A torrent gradually carved a ravine; the question of size was simply a question of time. All mountain tops, or nearly all, were formed in the same way. Tributaries, as a rule, joined the main stream in the direction in which it was flowing, but now and again one came across a tributary joining from an opposite direction. That meant that originally there had been

a second main stream, which the first had swallowed up. In the mountain chains there was abundant evidence of the manner in which water-courses had encroached on the areas of each other.

The battle of physical forces on the crust of the earth was very much like the battle of life—the strongest is the one that wins. The lecturer proceeded to say that there were hills and valleys buried beneath the present surface of the earth. The Lancashire and Cheshire plain was composed, first of all, of sand and mud. That sand and mud had an exceedingly interesting history. They had been accumulated underneath the waters of the sea. Icebergs, floating from the higher grounds in Cumberland, Scotland, and elsewhere, with their burden of sand, clay, and stones, dropped another layer of material on the plain, filling up the original inequalities of hill and valley. Engineers in this district would do well to keep this in mind. Unless they recognised the extreme irregularity of the clay and sand covering up the valleys and hills beneath our feet, they might put up works which would prove very unstable. It was a far cry from the neighbourhood of Manchester to Manitoba. But the great grass land of Manitoba was on very much the same geological footing as the Cheshire plain. It had the same irregular covering of sand and gravel, full of boulders, which had the same ice-borne history as the boulders in the boulder clay at Manchester. One very noticeable thing in Manitoba was that there was a series of lakes, not very big, but still lakes, all along the line of the Rocky Mountains. A good many of these lakes were saline; and when we came to examine their history it would be found that they were merely old river valleys, blocked up by sand and clay and mud, so that the water flowing down the flanks of the Rockies could not get away. The evaporation of the water left the lakes saline. Lake Superior and the whole of that group had been formed in the same way. They were merely old river valleys blocked up by great deposits accumulated by ice. It would be quite a simple engineering feat—far simpler than the cutting of a canal from Manchester to Liverpool—to turn the water from some of these great lakes into the Mississippi. The Cheshire meres had had the same sort of history, though some of them had, no doubt, been formed by the working of the salt mines.

Salt Lake, in America, had a totally different history. It was an insignificant fragment of what was once one of the grandest inland sheets of fresh water ever seen in the world. But in course of time the Sierras rose and cut off the moisture-laden winds from the Pacific. The lakes then gradually shrank up. While speaking of this district, he would like to mention another thing concerning it. The great central plateau of America had some of the most stupendous ravines in the world.

The cañons of the Colorado river were from 8,000ft. to 9,000ft. deep, with almost sheer sides. Here we had a fine illustration of the effect of running water. Water flowing along the same line during vast geological periods had carved these great ravines. Cañons were also to be found beneath the surface of the water. A careful survey, made for telegraphic purposes at the mouth of the Congo, had revealed the existence of a cañon some two or three miles wide and sinking to a depth of from one thousand to two thousand fathoms. It had all the characteristics of the Colorado cañons—steep sides, and a sudden plunge down to the depths. What did this mean? It meant that this area of Africa had been sunk since the formation of the cañon by the Congo. On the coast of Norway, too, submerged cañons were to be found. The fiords had, in the first place, been cut and carved by the rivers, and then ploughed out a little by the ice. It was absurd to suppose that the ice had done all the work. There was not the slightest evidence that a glacier had ever excavated a valley. The action of a glacier was merely the action of sand-paper on a piece of wood. It did not dig or delve. Of course, if a great mass of ice were applied to a soft piece of rock the result would be the same as if a piece of sand-paper were rubbed hard on a piece of wood that was locally soft. This operation had taken place in some of the Scotch lakes. The cañon, ravine, or valley, was there first, and had been worn and widened by the ice afterwards.

The inequality of the land surface beneath the sea was a proof that what was now the bottom of the sea was once land. Even with regard to the great depths of the ocean, he did not know that we were justified in coming to any other conclusion than that they were not permanent. The observations in the depths of the sea, it must be borne in mind, were comparatively few. If the British Isles were submerged and a ship came to take soundings—if the lead were dropped at Woodhead and then at Derby, the inference would be that the bottom was comparatively smooth and regular, as no account would be taken of intervening irregularities. The examinations made in the great depths of the sea during recent years for telegraphic purposes had been, in some cases, very minute; and places had been found where the bottom dropped down sheer to a considerable depth, suggesting the existence of a precipice.

The fact, too, that the rocks composing the greater part of the surface of the earth were of materials that had been accumulated under water, tended to show that present areas of land had at one time been under water, and that portions of the present sea bottom had at one time been areas of land. Such, said Professor Dawkins, in conclusion, were a few of the principles of Geology as applied to that most fascinating subject, the history of the present surface of the earth. Geological

science was to a large extent based upon the study of the present surface of the earth, and of the various agencies at work upon it. Geography, in its widest and highest sense, was the means by which geologists unfolded the ancient condition of the earth and the changes it had undergone.—Responding afterwards to a vote of thanks, Professor Boyd Dawkins expressed much sympathy with the educational work being done by the Manchester Geographical Society. The spread of geographical knowledge on a scientific basis was, he said, one of the things to which we should diligently apply ourselves. Geography had never taken the position in this country which it ought to have taken. When he considered the general run of geographical apparatus in this country he was penetrated with feelings, not so much of despair as of disgust. The Ordnance maps were getting worse, and for all first-class geographical machinery, including even small scale maps of the British Isles, we had to go abroad.

Heights of Mountains in the United States.—The highest summits in the United States are in Alaska. Mr. Dall's measurements are: Mount St. Elias, 19,500 feet; Mount Cook, 16,000 feet; Mount Crillon, 15,900 feet; and Mount Fairweather, 15,500 feet. He is the only authority for Mounts Cook and Crillon; but for Mount Fairweather Mr. Gannett gives six other measurements: Malaspina, 14,589 feet; Tebenkoff, 14,000 feet; Vasilieff, 13,946 feet; Russian Hydrographic Chart, 14,708 feet; English Admiralty Chart, 14,708 feet; and Tenekoff, chart III., 13,864 feet. For Mount St. Elias Mr. Gannett has six authorities: Malaspina, 17,854 feet; Tebenkoff, 16,938 feet; La Perouse, 12,661 feet; English Hydrographic Chart, 14,970 feet; Russian Hydrographic Chart, 17,854 feet; and Dall, 19,500 feet. These do not quite agree with the figures given by Dall, in the Report of the Superintendent of the United States Coast and Geodetic Survey for 1875. The latest measurement is that made in the summer of 1891, by Mr. Israel C. Russell, of the expedition sent out by the National Geographic Society and the United States Geological Survey. Mr. Russell's report on the height and position of Mount St. Elias was laid before the National Geographic Society, December 11, 1891, and is printed in the Society's *Magazine*, Vol. III., pp. 205-261. The elevation of St. Elias above sea level is, according to this report, 18,099 feet; and its position is settled, approximately, in longitude $140^{\circ} 55' 30''$ West from Greenwich. To use Mr. Russell's words: "The mountain is thus one and a half miles south of the boundary and within the territory of the United States. The position is so near the junction of the boundary separating south-eastern Alaska from the North-West Territory with the 141st meridian that it is practically a corner monument of our national domain." Mr. A. Lindenkohl writes, in *Petermanns Mittheilungen*, 38 Band, I., that Mr. Russell's measurement leaves the question still undecided whether Mount St. Elias or the Peak of Orizaba (18,205 feet according to Professor Heilprin) is the highest mountain in North America; and the editor of the *Mittheilungen* adds, in a note, that he has seen no occasion to change his opinion, expressed in 1891, as to the uncertain character of Professor Heilprin's results.—*Bulletin of the American Geographical Society.*

METEOROLOGY IN RELATION TO GEOGRAPHY.

BY PROFESSOR T. H. CORE, M.A.

[Addressed to the Society, in the large room of the Chamber of Commerce, Friday, April 29th, 1892, at 7-30 p.m.]

THE subject that has been given to me on which to address a few words to you this evening is "Meteorology in Relation to Geography," and I might have lent a varied interest to it by including under the term "Geography" some different but possible systems of Geography. The earth might have been considered a uniform smooth sphere, rotating about any axis or non-rotating, and with or without an atmosphere. Then various hypotheses might have been made as to the Geography of a non-uniform Earth, and the resulting meteorologies reasoned out. But I think you will agree with me that, though some of these problems might afford scope for ingenious reasoning and might lead to interesting results, the discussion would have a merely dialectical interest. I confine myself, therefore, to the only two cases of practical interest—first, the Earth considered as having a uniformly smooth surface, and second, the Earth as it is, the first being a necessary but somewhat rough approximation to the second. I propose, therefore, to consider, first, the general circulation of the atmosphere on the hypothesis of a uniform and smooth Earth, and to lay before you some of the results of the most recent researches on this subject.

GENERAL CIRCULATION OF THE ATMOSPHERE.

Hadley, in 1735 (*Phil. Tran.*), published a theory of the trade-winds, and Dalton in 1793 ("*Meteorological Essays*") independently arrived at a similar result. Dove (after meteorology had become an exact science) first gave a theory of the general circulation of the atmosphere, which was very generally accepted. His explanation took the following form: The sun's heat is not uniformly distributed over the Earth's surface, but decreases from the equator to the poles. The heated equatorial air rises and flows away in the upper regions towards the poles, while the cold polar air flows along the surface to supply the deficiency. In consequence of the rotation of the Earth, these currents become converted from N. and S. currents into a S.W. upper and N.E. lower current in the northern hemisphere, and a N.W. upper and S.E. lower current

in the southern hemisphere. The zone of calms is the region of the ascending air current, the trade-winds are the more or less easterly surface currents, and the variable winds of the temperate zones are due to the partial descent of the equatorial current down to the level of the polar current, and when the opposing winds meet gyrating storms ensue. But within the last thirty years, when telegraphic reports and synoptic charts of the weather began to be published, Dove's theory was found to be insufficient to account for many important facts, and has had to be abandoned. It did not account for the prevailing S.W. and W. winds in the temperate zones; it made the direction of wind gyration always clockwise in the northern hemisphere, whereas to the north of the track of a cyclonic swirl, the gyration is counter-clockwise, and it seems next to impossible to believe that the polar and equatorial currents meeting laterally can set in motion masses of air, sometimes 1,000 miles in diameter, with such a tremendous velocity as that of 70 or 80 miles an hour. More correct views of the atmospheric circulation are now entertained, chiefly through the labours of Ferrel, Sprung, Werner, Siemens, Hann, and Oberbeck. Ferrel's first meteorological paper was published in 1856 and his last in 1889. From the principle that the energy possessed by the atmosphere in virtue of its rotation round the Earth's axis is a constant quantity (as it must be, since any change in it would necessitate an equal and opposite change in that of the Earth's rotation), it follows that if a continual change in the position of masses of air takes place through equatorial and polar currents, the velocity of rotation of the whole atmosphere over lower latitudes lags behind that of the Earth, but in higher latitudes outstrips it. Consequently, at some intermediate latitude, which calculation makes about 35° , there must be a belt round the Earth where there is neither acceleration nor retardation—that is, where the air and the Earth are relatively at rest. We have thus the following system of circulation: Between 35° N. and 35° S. the resultant motion of the air is westwards. Near the equator, where the N.E. and the S.E. trade-winds meet, there is the zone of calms, its position varying with the sun's declination, but this calm-belt is only superficial, east winds prevailing in the higher regions. Beyond the 35^{th} parallels the general movement of the atmosphere is towards the east. At the Earth's surface, S.W. or N.W. currents flow from the high-pressure belt in latitude 35° , and become more westerly with increasing latitude. In consequence of the convergence of the meridians, air currents will meet and produce increased pressure, thus giving rise to anti-cyclones, from which air will flow out laterally in all directions. It is thus easy to see the origin of cyclones in temperate latitudes, which will be carried bodily in an easterly direction by the prevailing currents.

Up till a few years ago, most meteorologists believed that the zone of calms extended up to the highest regions of the atmosphere, only slowly-ascending warm currents prevailing there, and that in the immediate neighbourhood of this zone the surface trade-winds begin to rise, changing into the South-west and North-west trade-winds. But the new theory requires that Easterly currents should everywhere prevail between the 35th parallels, most strongly over the zone of calms and with diminishing intensity outwards. This theory has received confirmation from two facts, as thus described in *Nature* of last week.

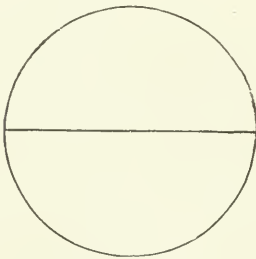
It is known that after the Krakatao eruption in the year 1883, the opinion was expressed that the frequent coloured phenomena of the sun in the tropics and the long evening glows were regarded as consequences of this eruption. The spread of these phenomena in the first ten days after the eruption was such that we were obliged to assume that the dust-haze thrown out had travelled round the earth in about twelve days from east to west; for the explanation of the diffusion of these phenomena, a violent easterly wind was required in the upper regions of the atmosphere in the vicinity of the equator. For a long time it was this easterly wind which threw doubt upon the whole hypothesis of the unusual appearances which were referred to the Krakatao eruption. But Siemens' theory of the general circulation of the atmosphere was thereby confirmed, and it found further support—on the one hand, in the observations of the motion of high clouds by Abercromby, and, on the other, in the mathematical establishment of Siemens' statement by Oberbeck.

In 1885, Abercromby, during a voyage from Aden to Australia, had observed that in the neighbourhood of the equator the cirrus moved from the east. He was much surprised at this, and wrote—"The discovery of an easterly current over the N.W. monsoon is not only altogether new, but also quite anomalous." He thought this so important that he undertook another voyage, from Mauritius to Bombay, in order to clear up the matter. The result of his further observations is couched in the following terms: "I may point out another very important result of these observations, namely, that the highest current between the equator and the doldrums is always from some point near East." About a year or so ago, Oberbeck published a mathematical theory of the atmospheric circulation, in which he arrived at formulæ which exactly reproduced Siemens' theory, so that little doubt exists that this must be accepted as the verdict of science in its present state.

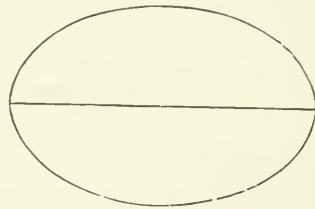
We see similar phenomena in the solar atmosphere, but on a far grander scale. Since these connection-currents depend for their *existence* on differences of temperature, the force of

gravity, and the rotation of the sphere, and for their *magnitude* on the intensity of these three factors, we shall not be surprised at their gigantic dimensions when we consider what these intensities are. Instead of the sun's atmosphere consisting of cool gases and aqueous vapour, it largely consists of metallic vapours in the highest state of incandescence.* Again, gravity on his surface is 27 times greater than on the Earth, and his equatorial speed of rotation, instead of 17 miles a minute, is 75 miles a minute. Accordingly we find, on the irrefragable evidence of the spectroscope, that cyclonic whirls exist in the sun's atmosphere whose speed sometimes attains nearly 10,000 miles a minute, and uprushes and downrushes exceeding a rate of 2,000 miles a minute, but we have no evidence of the existence of any equatorial or polar currents.

As bearing on the relation between climate and Geography, I think it necessary to say something about a recent theory of Sir R. Ball as to the cause of an ice age. The elliptic path which the Earth describes round the sun keeps the length of its major axis unchanged, but from planetary perturbations the shape of the orbit is slowly changing. Sometimes it is nearly circular, and then it passes by an extremely slow process into an ellipse of gradually-increasing eccentricity, and then in periods of time, which are to be reckoned in hundreds of thousands of years, the ellipse gradually returns into a circular form. It was one of the most brilliant achievements of the famous French astronomer, Laplace, that he proved such perturbations in the solar system to oscillate between certain narrow limits, and that therefore the system was stable.



Circular Orbit.



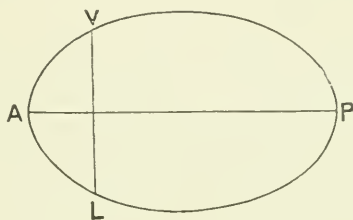
Elliptic Orbit.

Again, it must be remembered that in consequence of the spheroidal figure of the Earth and the attraction of the sun, moon, and planets on the protuberant matter at the equator, the

* If a lamp-black surface of the same size as that of the sun were raised to a temperature sufficiently high to emit the same amount of heat as the sun actually emits, Rosette has calculated that its temperature would be about 18,000° Fah., and the difference of temperature the upper surface of the photosphere and at a depth of a few thousand miles is in a probability to be estimated in thousands of degrees, increasing as we descend.

axis of the Earth has not a fixed direction in space, but describes a conical surface, with the pole of the elliptic as the centre of the base of the cone, and the time of one revolution is about 25,000 years, so that the line of equinoxes revolves in the plane of the ecliptic in this time. As, however, the major axis of the orbit revolves in the opposite direction, the time of a relative revolution is reduced to 21,000 years.

Now it can be proved that whatever be the excentricity of the orbit, if any line be drawn through the focus the heat received by the whole Earth in passing over the part of the orbit on one side of the line is exactly equal to that which it receives in passing over the other part. To take an extreme



case, let the line of equinoxes $V L$ be at right angles to the major axis $A P$, the Earth will receive the same amount of heat in describing $V A L$ as it will receive in describing $L P V$, but the northern hemisphere will have its summer in $V A L$ and the southern its winter. Therefore, the northern hemisphere will have a short and hot summer and a long and cold winter, while the southern hemisphere has a short and mild winter and a long and not hot summer, *i.e.*, the southern hemisphere has an equable temperature throughout the year, while the northern has one ranging between wide limits. All this has been well known for ages, but the new point proved by Sir R. Ball is this: "Each hemisphere receives 63 per cent of its total annual heat supply during its summer, and 37 per cent during its winter." This is true whatever the eccentricity and wherever the line of equinoxes.

In the case when the eccentricity is at its maximum and the line of equinoxes perpendicular to the axis major, the difference between the lengths of the summer and winter seasons amounts to 33 days, or the one is 166 days and the other 199, making up the whole year of 365 days. Let us now consider the case of the northern hemisphere, having its short summer in $V A L$ and receiving 63 parts of heat, with its long winter in $L P V$ getting 37 parts of heat. We must remember that the temperature of space being about minus 273° centigrade, the Sun's heat is therefore sufficient to raise the average temperature of the Earth about 300° above what the temperature

would be if the Sun's heat were totally withdrawn, so that a fall of 10 per cent in the heat supply would lower the temperature about 30°, or bring it down to the freezing point.

Let us compare the state of things during an ice age with what they are now. Our present summer is seven days longer than our winter, or the two periods are respectively 186 and 179 days. Our present mean daily heat supplies are, therefore, as 34 to 21 for summer and winter respectively. In an ice age these numbers become 38 and 18, so that in the long winter of 199 days there is a falling-off of about 15 per cent in the heat supply. In these long and intensely cold winters more ice would form than the short hot summers could possibly melt, and an ice-cap thus growing for years, and more probably centuries, is quite sufficient to account for the covering of a large part of the northern hemisphere with a sheet of ice hundreds of feet in thickness. All this time the southern hemisphere would be enjoying long mild summers and short and not severe winters, so that abundant evaporation would take place and supply the vapour which, put in circulation by the winds, would supply the material from which the ice is formed. And, again, as the eccentricity changes with extreme slowness, the line of equinoxes must have had two or three successive revolutions before the eccentricity had become small enough to render an ice-age impossible, so that several glacial epochs must have followed each other at intervals of about 21,000 years.

I have purposely left myself little time to dwell upon the numerous modifications which the complex geography of our globe impresses on its meteorology, because most of these must be familiar to you all, nor conversely on the changes which its meteorology makes in its geography. But I must mention certain principles of Physics which will enable us to understand these changes more easily.

First: The heat that is accompanied by light—or light heat as it is called—behaves in some respects very differently from heat unaccompanied by light, or dark heat. The former passes freely through certain transparent substances, such as glass and dry air, without being absorbed by them; but the latter cannot. As an example, take the case of a glass conservatory, not artificially warmed. The Sun's heat passes freely through the glass, and is absorbed and converted into dark heat by the leaves and soil inside; but the dark heat cannot pass outwards again, so that the glass-house is a veritable *trap for catching sunbeams*.

Thus we can understand why the temperature falls as we ascend in the atmosphere. The Sun's heat passes through the air without perceptibly heating it, but it heats the land and the water, becoming converted into dark heat, and it is by this dark heat that the lower strata of the air are heated. On Mount

Kilima-Njaro, which lies almost under the equator, snow lies all the year round above the height of 16,000ft., while the average temperature of the air at the level of the sea in this part of Africa is about 85° F. And as snow does not lie unmelted all the year round except near the poles, a vertical ascent of 16,000ft. at the equator produces the same fall of temperature as a surface journey north or south of it over 5,000 miles. An obvious inference, therefore, is that both isobars and isothermals will be affected by elevation of the land, though it is usual in charting them to reduce both to sea level.

Second: The specific heat of water is much higher than that of the land, or, in popular language, water is both more difficult to heat, and, when heated, more difficult to cool than land, or, in fact, than almost anything else. It was at one time thought that water had a higher specific heat than any known liquid, but in a paper published in the "Transactions of the Royal Society" for 1869, Messrs. Dupré and Page showed that a mixture of alcohol and water, in the proportion of 1 to 4, has a specific heat 5 per cent higher than that of water.

This fact supplies a key to explain several important meteorological phenomena. It shows why an insular or a maritime climate should be an equable one, as opposed to a continental climate, where low water and high summer temperatures prevail. Our average temperature in Great Britain ranges from about 40° to 60° F.; but in Central Asia, in the same latitude and at the height above the sea, the average temperature ranges from 0° in winter to about 70° in summer. It also explains the existence of land and sea breezes.

Third: The tension of aqueous vapour increases more rapidly than the temperature. For instance, the tension at 40° F. is .248 of an inch of mercury, at 50° it is .361, and at 60° it is .518; so that if two equal masses of air at 40° and 60° each saturated with vapour should mix, instead of the mixture having a mean tension of .382 it has only .361, so that the mixture of the two saturated masses would result in a precipitation of rain. We thus see that if two currents of air, each able to maintain in suspension its own burden of aqueous vapour, come to mix, the joint mass cannot retain the joint vapour, and so clouds are formed or rain falls.

Fourth: The waters of the ocean are at different places of different temperatures and different densities, and so, helped by the prevailing winds, a constant interchange takes place among them and sea currents are produced. If you look at any map of these currents you will see how numerous and powerful they are, and how strongly they must influence the climate of places they pass.

NOTES ON THE EARLY DISCOVERY OF AUSTRALIA.

(See Maps.)

BY MR. E. DELMAR MORGAN, F.R.G.S.

[Addressed to the Members, in the Memorial Hall, Wednesday, March 2nd, 1892.]

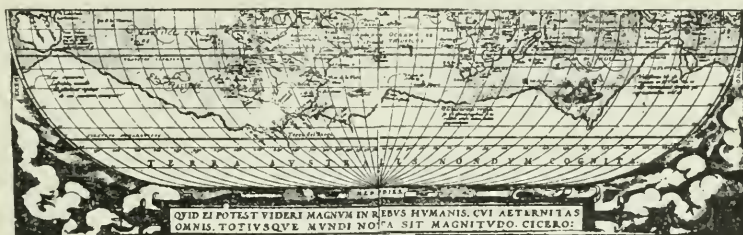
FOR the last thirty years the early discovery of Australia has attracted the attention of geographers. In 1859, the late Mr. Major edited for the Hakluyt Society a collection of documents relating to this subject,* accompanying these with a learned treatise on the earliest maps and voyages to that part of the world. He was followed by other writers, English and foreign, all of whom have endeavoured to throw further light on the discovery of the southern continent. When was Australia discovered, and by whom? are nevertheless questions almost impossible to answer at the present day. The fact that the earliest MS. maps known to us are the work of French cartographers would lead us to suppose that French navigators were the first to visit those coasts and bring home reports of a vast *terra firma* in the southern sea, named by them *Jave la Grande*, were it not that the only Frenchmen who are believed to have sailed those seas in the 16th century are the almost mythical *Sieur de Gonville* and Captain *Jean Parmentier*, who made a voyage to Sumatra in 1529, but does not appear to have seen Australia. French writers do not even claim for their countrymen the priority in the discovery of the South Sea.† The Portuguese, on the other hand, were settled in the East Indies at the beginning of the 16th century; their viceroys at Goa were in the habit of sending expeditions to explore the islands and seas of the Malayan archipelago, and in the course of these voyages the mainland may have been seen. Yet, with one exception, that of *Godinho de Eredia*, there are no records of any of their explorers having sailed so far south, and even he obtained his information second-hand.

* "Early Discovery of Australia."

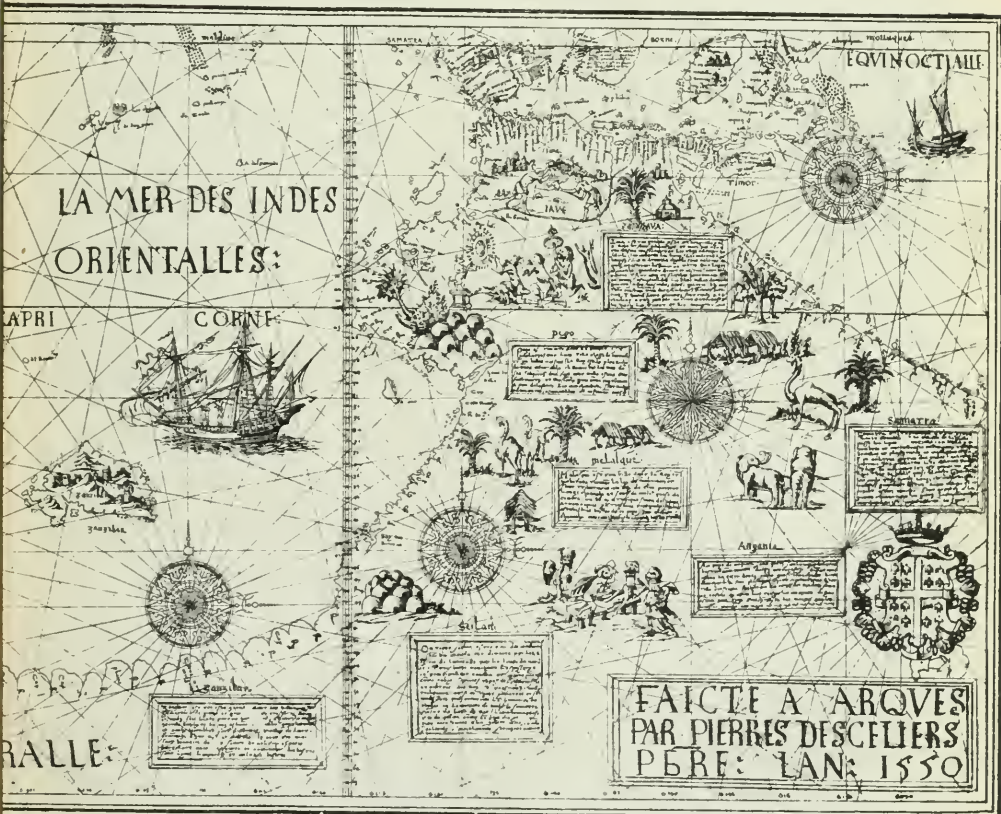
† M. Guibert, in his "*Mémoires pour servir à l'histoire de la Ville de Dieppe*," does justice to the Normandy navigators, as do M.M. Estancelin, Vitet, and Margry in their works; nevertheless, no proofs have hitherto been adduced of any French discovery of Australia in the 16th century, except the maps mentioned above. Unfortunately, in the bombardment of Dieppe in 1694, most of the archives were destroyed.

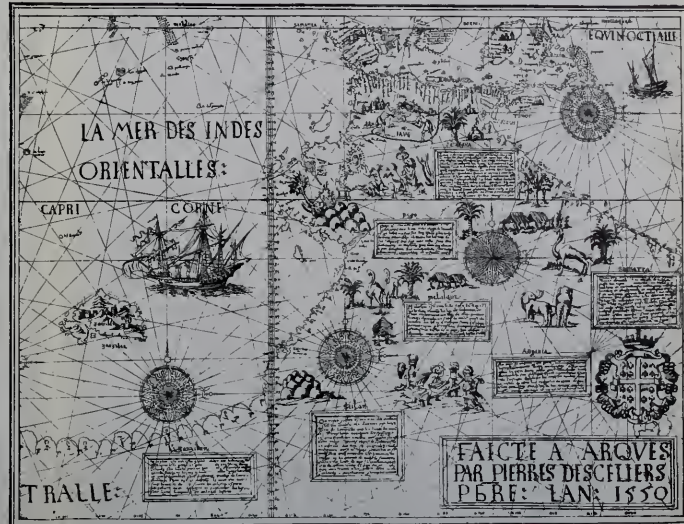
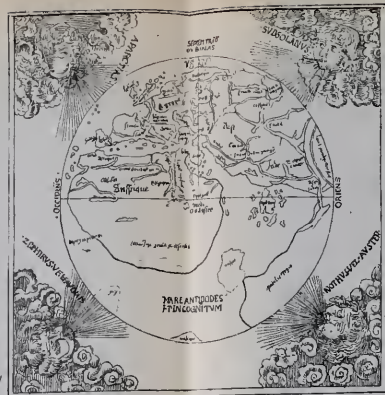


MAP OF THE WORLD, BY G. WILHELMUS BLAEU, 1662.



MAP OF THE WORLD, BY G. WILHELMUS BLAEU, 1662.





- 1 *Mappe Monde (La Salle) circa. 1522*
- 2 *Orontius Finaeus 1531*
- 3 *Map of South Polar Continent. 1597*
- 4 *Map of the World, Descartes 1531*
- 5 " " " G. Mercator 1567
- 6 " " " Ortelius 1570
- 7 *Australian Atlas. 1690-1700*

REDUCED FAC-SIMILE MAPS TO ILLUSTRATE
MR DELMAR MORGAN'S ADDRESS ON
THE EARLY DISCOVERY OF AUSTRALIA.

If we consider how it happens that information concerning this southern continent is so fragmentary and unsatisfactory down to the period of the Dutch voyages in the 17th century, we are reminded that the maritime nations of Europe were fully engaged in the exploration of other parts of the world; the new continent of America, the East Indies and the Spice Islands, were the goal of every expedition that sailed from the ports of Spain and Portugal. Australia, though vaguely delineated on maps, lay outside the track followed by vessels to the East Indies and Malay archipelago; its riches were unknown and its inhabitants savages. Nothing here tempted the early navigators and adventurers, while the cosmographers were content to theorise that a great continent surrounded the Antarctic Pole to serve as an equilibrium to the vast expanse of dry land in the northern hemisphere. But where that continent began, how far it extended, and what was its nature, were questions not likely to interest many in those days. The golden secret of Australia was to remain locked up for centuries, though Godinho de Eredia's Malaysians had by chance revealed it.*

The earliest printed indications of a southern continent occur on the maps of Leonardo da Vinci,† the globes of Schöner, and on a mappemonde by La Salle,‡ published in 1521 with a work on geography by this author. This last-mentioned map, as originally drawn, probably dated from the 15th century, the Australian part being added subsequently. The name given to this roughly delineated Terra Australis is *Patulie regio*, meaning, according to Vicomte de Santarem, who derives it from the Sanskrit, "the nether region," *i.e.*, "hell."§

The next is a double cordiform map by Orontius Finæus, a French cosmographer of Provençal, dated 1531. On this, and the later maps of Gerard Mercator (1538), Ortelius, Hondius, Philip Apian, Wytfliet, and others, the Antarctic continent takes a more definite shape, showing the influence of discovery on cartography. The coast-line approaches South America, divided from it by the newly discovered strait of Magellan; east of Africa the land runs up northwards with the legends, *Brasielie regio*, *Psittacorum regio* (land of parrots);|| further east again the

* This explorer and his discoveries have been discussed by M. Ruelens, Dr. Hamy ("Bulletin de la Soc. de Géographie," Vme série, tome 15), and by Mr. Major ("Archæologia," vol. xlv), all of whom leave the matter in some doubt. The general inference to be derived from a study of their writings is that Godinho's claims to rank as a discoverer rest wholly on his surveys in Malacca, not on any presumed discovery by him of Australia.

† In 1514-15, according to Wieser, "Magalhães-Strasse and Austral Continent," &c.

‡ There are two versions of the La Salle map, the one reproduced in the Vicomte de Santarem's Atlas, and that in the Royal Library, Stockholm, facsimiled in the Eng. ed. of Baron Nordenskiöld's Atlas. Our reproduction is from the latter.

§ Wieser derives *Patulis* from the Latin *pateo*, meaning that it was the open region masking the hidden interior of the continent. Mr. Petherick, a well-known writer on Australian discovery, has suggested that *Patulis* should be *Pratalis*, a name given by the Spaniards to a part of S. America—the Rio de la Plata; the letters "l" and "r" being interchangeable. His argument is based on the occurrence of another American name, "Brazil," on the Austral continent.

|| Possibly the birds of paradise of New Guinea.

coast stretches nearly as far north as the tropic of Capricorn, and bears the above-mentioned legend, "Regio Patalis." The Antarctic continent is indented by a deep gulf, nearly dividing the portion corresponding with Australia from the mainland; mountains are shown at intervals round the coast, and across the centre is the legend, *Terra Australis recenter inventa sed nondum plene cognita*. These maps were probably based on the discoveries of Amerigo Vespucci and Magellan. Ramusio says*: "E sopra tutto è vietato il poter navigar oltra il capo di Buona Speranza a dritta linea verso il polo Antartico dove è opinione appresso tutti li pilotti Portoghesi che vi sia un grandissimo continente di terra ferma, la qual corre levante e ponente soito il polo Antartico. E dicono che altre volte uno eccelente uomo Fiorentino detto Amerigo Vespuccio con certe navi de i detti Re la trovò e scorse per grande spatio, ma che dappoi è stato prohibito che alcun vi possa andare. . . ." This passage would imply that the Portuguese pilots knew of a great continent bordering the seas they were navigating; and this was not mere theory or conjecture, for Amerigo Vespucci had coasted along it† for twenty leagues before turning towards the equator; and, lastly, with the well-known secrecy of those times, further exploration in this direction had been prohibited.

"The shores are but little known," writes Wytfliet towards the end of the 16th century, "and the route thither, after one or two voyages, has been abandoned; only accident could have driven some storm-tossed vessel in that direction."‡

Exaggerated notions prevailed of this southern continent, for the navigators who had visited those seas imagined that the islands they saw were connected with the mainland. Ortelius and Mercator had indeed separated New Guinea from Australia, while expressing the uncertainty of the period by the following legend: "Nova Guinea nuper inuenta quæ an sit insula an pars continentis Australis incertum est." But in later maps,§ for many years Torres had sailed through the straits named after him, New Guinea was represented as a peninsula of Australia, and it was not till Captain Cook's famous voyage in 1770 that the two were finally separated.

The MS. maps of Australia of the 16th century are all French. There are, I believe, seven or eight of them in existence, and five of these emanate from the school of Arques, near Dieppe. All

* "Navigationi e Viaggi," 1544, vol. i., fol. 124.

† Or some island, probably Georgia, in 52° S. lat.

‡ "Descriptionis Ptolemaicæ augmentum."

§ Two book maps should also be mentioned; one occurs in a polyglot Bible of Arias Montanus, dated 1571. The other is engraved from a pen-and-ink sketch found in the narrative of a voyage in 1668 to the Ladrone Islands, by Friars Diego Luis de San Vitores and Marcelo de Ansaldo. This map bears the signature of the last-named of these monks; it represents the whole Antarctic region as a continent, with the words "Tierra Austral no conocida" across it. New Guinea appears as a promontory, but the islands of Java, Sumatra, and the Moluccas are detached and in their right positions. This map is reproduced in the "Cartas de Indias," published by the Ministerio di Fomento, Madrid, 1877.

that is known of these Dieppe cosmographers is contained in a few lines in Père Fournier's "Hydrographie," quoted by M. HARRISSE*: "La 3 espèce (*sic*) est de certaines cartes qu'on appelle Reduites, dont un nommé le Vasseur, natif di Diepe, a enseigné la pratique à nos François. Cet homme quoique tisseran en son bas age, ayant eu quelque instruction d'un nommé Cossin, homme fort ingénieux et qui auoit une excellente main et veu les mémoires des certains Prestres d'Arques, Bourg près de Diepe, qui estoient excellents Geographes, dont l'un se nommoit des Celiers et l'autre Breton, a si bien seeu menager ce peu de lumiere qu'il a receu d'eux qu'à force d'esprit et de trauail continu, il est arrivé à un tel point qu'il a esté admiré de plusieurs. Il est mort à Rouen depuis peu d'années."

Two maps are contained in a handsome atlas by Jean Rotz, in the British Museum, dated 1542, of whom little is known, except what he tells us of himself in his dedication—that he was hydrographer to Henry VIII., King of England, and had originally dedicated his book to the King of France, his sovereign and natural lord. There is, however, some ground for believing that he is the same person as John Rut, captain of a ship sent on a voyage of discovery to Newfoundland in 1527. A letter written by this John Rut to King Henry VIII. is printed in Purchas's collection (iii., 809).

Three or four more of these MS. maps are the work of Pierre Desceliers,† the priest of Arques referred to by Père Fournier in the passage quoted above, and in M. HARRISSE's opinion the person of whom Desmarquets‡ speaks as the author of French hydrography. Two of his maps now in the British Museum are fine specimens of the art of cartography in the 16th century. They are large planispheres of the world on parchment, with illuminated borders, bearing the arms of France and Dauphiny. The earliest is known as the "Harleyan" map, having belonged to Edward Harley, Earl of Oxford.

Another of the Desceliers maps in Jomard's facsimile atlas has been photographed for the British Museum, and on this the words "Faictes à Arques par Pierre Desceliers, presb^{re} 1546" are distinguishable in the right-hand top corner. This copy formerly belonged to Jomard, and was afterwards acquired by the late Earl of Crawford. A third, also in the Museum, purchased from the late Prof. Christoforo Negri of Padua, bears the date "1550," and is probably the most elaborate and finest of all. M. HARRISSE§ mentions another map by Desceliers, the property of the Abbé Sigismond of Bubies, near Vienna, exhibited

* "Jean et Sebastien Cabot," p. 216.

† Deeds relating to the Desceliers family, dated as far back as 1537, have been discovered at Dieppe. (HARRISSE, *l. c.*, p. 217.)

‡ "Mémoires Chronologiques de Dieppe," 1785.

§ "Jean et Sebastien Cabot," p. 218.

at the Geographical Exhibition in Paris in 1875, but this has not been accessible. Besides these there is the atlas of Nicholas Vallard (1547), in the late Sir Thomas Phillips' collection, and that of Guillaume Le Testu (1555), a pilot of Havre de Grâce, preserved in the Ministry of War at Paris. To these must be added a mappemonde by Nicolas Desliens, sometimes confounded with Desceliers, made in Dieppe in 1566; and lastly, a semi-elliptical map, by Jean Cossin, dated 1570, reproduced by Gaultier, of Paris.

On all these MS. maps of the first half of the 16th century, Australia appears as a huge continent, extending to within five or six degrees of the equator, and forming, as it were, a great peninsula of a still larger southern continent, filling in the whole southern border of the old maps. There is, however, a marked difference between the way in which the coast-line of this conjectural "*Terre Australle*" is drawn and that of Australia proper, for while the former is indefinitely and conventionally put in, the latter shows, with full detail, islands, bays, peninsulas, capes, and rivers, and has all the appearance of being founded on actual survey.

Examining these maps more closely, we find the position of Australia twenty degrees too far to the westward; the island of Java separated by only a narrow strait from Jave la Grande, the mainland; the interior of this continent filled with descriptive texts and curious figures of animals, such as camels, elephants, lions, representations of the natives and their habitations, castles, trees, &c.—in fact, anything but what one would find in Australia. Cartographers in those days were, however, accustomed to fill in blanks on their maps with imaginary pictures and hearsay descriptions, a mixture of fable and romance.

The coast-line is approximately correct, always bearing in mind that it extends twenty degrees too far to the west, and that the island of Java has been almost united with the mainland. Allowance having been made for the difficulty of computing longitudes in the 16th century, and for the influence of Marco Polo's geography, the old maps will be found substantially to agree with the modern as far south as 35°. On the east, however, a promontory juts far out to sea, terminating with Cap de Fremose, or Beautiful Cape, in about the position of Wilson's Promontory on modern charts. This shows that a fictitious coast-line has been run out to join a headland actually seen. South of 35° the coast-line has been continued indefinitely to the southward to block the seaway.

With regard to this Cape Fremose, or Fremoso, several explanations have been given. One is that the point of land here represented is part of New Zealand, the northern island being in about the same latitude; another, that the Spaniards gave by analogy to this coast the same shape as South America,

where a cape or river Ferroso also occurs: a third suggestion is that this promontory is Tasmania, pushed up to the east coast.

An Australian geographer, Mr. George Collingridge, of Gladesville, New South Wales, has lately sent me his interpretations of the names on the so-called "Dauphin" chart of Desceliers, restoring the Gallicised names to their original (as he thinks) Portuguese forms.

WEST COAST.

<i>Old Names.</i>	<i>Modern Identifications.</i>
Cabo Leoa.*	Cape Leeuwin.
Abrolhos †	Houtman's Abrolhos.
Lame (Haure) de Cisue.	Swan flat and river.
Terra Anegada (submerged land).	Shoal Bay. ‡
Costa d'Ouro §	Gold region recently found in Kimberley.
R. de S. ^o Spirito.	Daly River.

NORTH AND EAST COASTS.

<i>Old Names.</i>	<i>Modern Identifications</i>
Anda ne Barcha. ||	Gulf of Carpentaria.
Islas de los Aligadores.	Crocodile Islands.
Ribera de Muchas Islas (Coast of many Islands).	Sandy Cape.
Costa Peligrosa.	Dangerous coast. **
Bahia Perdita (Lost Bay).	Broad Sound. ††
Costa de los Herbages (Coast of Pastures).	Coast between Port Macquarie and the McLeay River. ‡‡
C. de Fremoso or Hermoso (Beautiful Cape).	Wilson's Promontory.
Costa de las Gracias. §§ (Coast of the Pope's Grant).	Point Perpendicular and Jervis Bay.

Looking at these charts with all their detail of nomenclature, their compass bearings, scales, and the generally correct idea they give of the coasts of Australia, it would be impossible to assert that they are purely imaginary, fictitious representations of an undiscovered continent. But the narratives of voyages in the early part of the 16th century contain no description of a southern continent. The only allusion to one is that given by Ramusio from the account of the pilot Gaetan, who heard that a small vessel, the San Juan, sailed 650 leagues (2,600 miles)

* Probably so-called by the Portuguese from the resemblance of the continent of Australia to a lioness's head.

† Said to have been discovered by the Portuguese navigator, Don Jorge de Meneses, in 1527.

‡ A name given by Captain P. P. King to the same locality.

§ Showing that the existence of gold in the locality was evidently known to the Portuguese. An old chart is said to have the words "Terra Aurifera" here.

|| Meaning, "No boats or ships go here." Two islands at the entrance of the gulf are probably Baly and Lambok.

** Referring to the barrier reefs shown on modern charts.

†† The same as Cook's Bay of Inlets.

‡‡ This part of the Australian coast presents a succession of scrubby flats and scrub-covered plains, with here and there rounded timber-covered peaks. This country, adds Mr. Collingridge, looks very much like pasture land from the deck of a vessel at sea.

§§ The eastern coast of Australia fell within the Spanish hemisphere, according to Pope Alexander's line of demarcation

without losing sight of land, running nearly east and west, and that this land was found to be inhabited by a naked black people with short hair, who came to the coast carrying darts and clubs to make war, and that they were very active. This, observes Mr. Petherick, in an article contributed to the *Melbourne Review*, is the earliest account we have of the natives of Australia, and may be taken as a true picture of the inhabitants of Queensland 250 years ago. But this was in 1545, and the earliest of the French charts is dated 1542.

The first authenticated voyage to Australia is that of the yacht *Duyfhen*, or *Dove*, in 1606, the same year that Torres sailed through the straits between Australia and New Guinea. In 1642, Tasman sailed across the southern tropic, and discovered New Zealand and Van Diemen's land, now named after him. But the Dutch voyages in the Pacific were made with the express aim of discovery, and to make known the unexplored continent which Quiros had boasted that he had discovered, and to which he had given the high-sounding title of *Terra del Espiritu Santo*.

* * An interesting discussion on the subject of this paper took place at a meeting of the Royal Geographical Society of Australasia, at Sydney, in 1892; the report, with additional maps, will be found in their Proceedings, Vol. 5, Nos. 4 and 5 (with maps), and a paper, also with 13 maps and diagram, by Mr. G. Collinridge.

The Glaciers of Mount St. Elias.—Mr. Israel C. Russell describes, with a map, the results of the Mount St. Elias expeditions of 1890 and 1891 in the *American Journal of Science* for March. The glacier system of the region is its most interesting feature. The snow-line occurs at an elevation of about 2,000ft. above sea-level, and from the vast snow-fields which lie above that level hundreds of glaciers of the Alpine type descend. The Seward Glacier, the largest, is fully fifty miles long and three miles wide in the narrowest part. All the glaciers unite in one immense "Piedmont glacier" called after the early explorer Malaspina. The Malaspina Glacier extends unbroken along the coast for seventy miles west from Yakutat Bay, and has an average width of between twenty and twenty-five miles. It forms a nearly horizontal plateau of about 1,500 feet in elevation, and 1,500 square miles in area. The centre of this prairie of ice is free from moraines, but moraines spread out from the tributary glaciers on the north, and its southern border is covered with moraine material bearing a strip of pine forest. The expanse is divisible into three lobes, the largest of which is at the base of the Seward Glacier, and flows eastward, melting before reaching Yakutat Bay. The central lobe, an expansion of the Agassiz Glacier, flows south-west, and the third lobe, containing ice mainly derived from the Guyot Glacier, flows south, and, reaching the sea without melting, breaks off in magnificent ice-cliffs. It is the only glacier in Alaska which advances into the open ocean. The marginal moraine is full of rudely circular lakelets, the crater-like hollow of which is undercut at the base, and as the walls melt immense quantities of boulders and debris accumulate at the bottom. Eventually the lakelets are drained through crevasses and the rubbish remains as a pyramid 50ft. or 60ft. high, which remains when the general surface of the glacier melts away. The marginal forests grow on the moraine material resting on ice, in many places 1,000ft. thick. It would appear that in one instance a cape, reported by Vancouver, has been cut away during the century which has elapsed since his voyage, and the whole forest belt at that point has been removed. The drainage of the Malaspina Glacier is entirely from beneath, the streams emerging from tunnels under the ice, in which the characteristic sand and gravel heaps of *cessais* are being formed.—*Proceedings of the Royal Geographical Society.*



MAP OF SICILY

to illustrate a Paper by

W. Angelo Waddington, Esq.

English Miles
0 5 10 20 30

13 Long. E. of Greenwich.

SICILY.

(With Map. Illustrated with a large number of fine Lantern Slides)

By MR. W. ANGELO WADDINGTON (President of the Burnley Literary and Scientific Club).

[Addressed to the Society, at the Memorial Hall, Friday, December 9th, 1892, at 7-30 p.m.]

IN undertaking to address your society on the subject of Sicily, my simple purpose is to draw attention to its undoubted claims as a field of delightful travel. The charms of Sicily are many-sided, and it would take a long series of papers to do the barest justice to its manifold attractions.

It is possible that other countries could be selected which would equally well gladden the heart and delight the eye, and it is quite certain that what are termed "creature comforts" might elsewhere be more confidently guaranteed. It must, however, be claimed, that by those who travel to gratify the mind as well as the eye—those who believe that the highest mental stimulus is to be found only in a combination of nature, art, and life—those who crave for the due representation of beauty, picturesqueness, and sublimity—by such, the Sicilian tour will be regarded as a model one.

There is no mere seeing of snowy peaks, purple mountains, blue oceans, placid lakes, picturesque vistas of wood and dale and stream. These things, looking mutely at you, as it were, always get quite as much admiration as they deserve—just as does the human parallel of a pretty woman without wit. But here we have all this with the vivifying influence of rich and powerful association—the deeds of great men—the works of great minds—where we never tread but we "set our foot upon some reverent history"—something to fix the scene and keep the memory green for long years.

Of this island it is certainly true that "travelling is no fool's errand to him who carries his eyes and his itinerary along with him." The votaries of science and literature, art and antiquities will feel no disappointment here. The history of the island (an epitome of the history of Europe) has for a background the most poetic and beautiful of ancient myths, and within itself some of the grandest figures of all time; whilst its natural beauties, at points, are such that men like Sir Henry Holland,

who have travelled the wide-world over, have declared that earth has no fairer sights to show us.

Though Sicily is now part of Italy, it is quite surprising that so few Italian travellers extend their journey thither. The regular "Italian round" will doubtless exhaust the time, and possibly the funds of many; and it is likely that the reports of brigandage in Sicily have deterred, and do still deter, many of the more timorous souls; but on the latter score there is now no real danger to the tourist. It is not easy to institute a comparison betwixt the attractions of Italy and Sicily. Many of the matters that delight one so much in Italy—the great picture and sculpture galleries—the grand mediæval cities—the great mediæval names—and those of the Renaissance so familiar to us—are scarcely represented here; but still, despite this, there are special charms about Sicily which are probably due to the fact that it has more of Africa in it than Italy, and more of Greece than either. The Greek name of Sicily was Trinacria—expressing its triangular form. One side is presented to Italy, another to Greece, and another to Africa, and the island has been influenced by each, and has formed the battle-ground in the strife for supremacy betwixt these three great ancient powers. It has been invaded by Goths and Vandals, and has been possessed by the Byzantines, the Saracens, the Normans, the French, the Spanish; and even the English have had a hand in her affairs.

Most of these peoples have left substantial and characteristic works behind them, and the strong chain of historic association is supported by the impressive buildings and beautiful works of art erected by the genius of each succeeding age. History was manufactured at a very rapid rate in this island, and it is necessary to closely follow the collateral effects of these succeeding "occupations," and study the impress they made on the island itself before we can realise what Goethe meant when he said, "Without Sicily Italy is nothing;—Sicily is the key to the whole."

In Sicily (as in common with all classical countries) the early history is obscured by fabulous traditions and vague poetical allusions, concerning which it is only possible to proceed upon the lines of Josephus, who, with praiseworthy candour (in relating anything calculated to stagger a man's belief), adds—"Of this you may believe as much as you please." It is not without reason, however, that Sicily has been styled "the Golden Fairy Land of the Antique World." Those who, like myself, were largely nourished, in their school days, on myths and ancient heroic history, will be glad to see where Persephone "sporting in innocent happiness on the plains of Enna," until Pluto, in the warmth of his affection, carried her to a still warmer sphere. To be where Athene, with a troop of cheerful nymphs, guarded

the warm springs of Himera; where Cayene was wooed by Eolus; where Arethusa still lives in the famous fountain at Syracuse; where Hygeia dispensed the blessings of health at the baths of Venéré; where abode the gentle Acis and Galatea and the Cyclops Polyphemus. It is interesting also to follow Ulysses in his voyage up the west coast, and especially so to see the identical rocks, three in number, which were flung at him by the enraged and much-derided Polyphemus!

Delightful as these somewhat mythical associations may be, we must hasten to more solid ground where the works of men's hands testify to their former living presence.

On a previous occasion, in introducing this subject, I thought it necessary to work into the general mosaic a short sketch of Sicilian history. It would hardly be complimentary, however, to a learned society like this, to assume an inability on the part of members to invest places and things with their appropriate historical setting. So to avert possible irritation and to economise time, I will ask those present to fill in any blanks as they are best able, confining myself to a few general allusions.

Leaving out of consideration the ancient Siculi and the Phœnicians, the true glory of Sicilian annals begins at the time that the Athenians founded Naxos and Syracuse, about 735 years B.C. Other cities followed, and the colonists erected their magnificent temples and public buildings, bringing into play their science, art, and poetry, and investing their foundations with all that constitutes the intellectual culture of the Greeks.

The cities of Gela, Agryas, and Syracuse especially rose to great power.

We can only refer to the work of destruction wrought amongst the Greek cities by the Carthaginians in the fifth century B.C., and the advent of a new power—that of Rome—two centuries later. From the time of the "Servile Wars" few events of importance occurred for some 500 years (excepting the introduction of Christianity by St. Paul), when the island was invaded by the Vandals.

About the middle of the sixth century the island came under the sway of the Byzantine Empire. It was again conquered by the Saracens, at the beginning of the ninth century, who, in their turn, occupied the island for some 200 years. In the middle of the twelfth century the Normans were very full of "the spirit of adventure" (as we well know), and undertook another invasion of Sicily, "on invitation" as usual. They ruled, and ruled well, for 100 years, when the dynasty closed with that most sadly romantic incident, the death of Manfred, the last of the Normans. Then followed Charles of Anjou and French rule, which was brought to a speedy and sensational end by the massacre of the Sicilian Vespers in 1282. All the real interest dies out of Sicilian history at this point. For some century and a half

the island was a dependency of the Spanish Crown. The country was neglected, its resources were undeveloped, and, after many vicissitudes (including the questionable blessing of an English philanthropic interference, which left them worse off than they were before); the invasion of Garibaldi and a subsequent popular vote united Sicily to the kingdom of Italy. Let us hope, as all must who have felt her sweet fascinations, that, under this more beneficent rule, her long series of troubles are over. She has been left far behind; but in the introduction of railways, of a more settled government, and in the subjugation of the lawless and brigand element, she may, reflecting on her former greatness, find that peace—the offspring of true power—has “victories no less renowned than war!”

The Greeks are represented by temples and theatres at Syracuse, Girgenti, Segaste, Selinunto, &c. The Romans by parts of the theatre at Taormina, the amphitheatre at Syracuse, and other remains. The Byzantines by buildings and mosaics at Monreale, Cephalu, and at the Capella Palatina at Palermo. The Saracens by La Zisa and other works. The Normans by the Cathedral at Cephalu, La Mortorana, and so on.

To those who feel little interest in the antiquities, there are the attractions of most lovely natural scenery, but here “nature is not at variance with art, nor art with nature.” The gentle finger of art has touched nature here and there, and vested many a rock and hill with a greater beauty; indeed, it is in this delightful country that we feel the special power of Young’s line, that “Nature is the Art of God.”

There is a proverb which says, “See Naples and die.” “Commentators” disagree as to the meaning of this phrase. Some apply to it a very literal meaning, like Mark Twain, who says: “Well, I didn’t die, but it was a near squeak, for the stench nearly killed me.” But on the present occasion we shall take it to mean that, at Naples, natural and artistic beauty has attained its highest expression, and that there is nothing better of the kind to live for. Now this is a huge mistake. To those *blase* in this kind of sight-seeing, and in despair about further sensations, we should recommend a certain stimulant—“Go to Taormina.” It has all the elements of a truly grand scene, with Etna centering the view—“snow-capped yet tipped with fire”—“inspiring awe till breath itself stands still.” This is the place to bid farewell to this world’s beauty. Naples has nothing to compare to it, and, as many believe, there is nothing to exceed it in the wide world.

We are now face to face with the difficult task of realising to your minds the exceeding beauty and intense interest with which our subject is invested. It is quite hopeless through the medium of words or illustrations to bring before you any idea of the varieties of form and colour in the Sicilian landscape, and

it will be impossible to do more than impart the merest flavouring of the changeful local accessories which tell with such subtle and poetic piquaney in almost every scene.

To sail from Naples at sunset, just as Vesuvius, with its smoky white cloud, lies in a slumberous haze, and the points of the city and the neighbouring heights are tipped with golden light; to pass quietly under the cliffs of Capri and out by the other glorious islands of the bay to the moonlit sea; to behold, in the clear morning light, the gradual unfolding of the many beauties of the Bay of Palermo; is to experience that which may be strongly felt, but that which can never be adequately described.

This is undoubtedly the best way to approach Sicily. The best scenery of the island is at Palermo and Taormina—the latter carries the palm—but to begin with Palermo is sufficiently startling. The general scene is more striking than the Bay of Naples, the mountains being bolder and more concentrated. There is no “Vesuvius” in the background, but there is no sense of deficiency. The rocky prominence of Monte Pellegrino bounds the view to the right, and Goethe calls it “the grandest promontory in the world.” The mountains of Catalfano rise precipitously to the left, and a range of picturesque peaks fill in the background. Cradled at the base of these hills lies the city of which Symonds says, “Perhaps there are few spots upon the surface of the globe more beautiful than Palermo.”

The marvellously fertile valleys about Palermo are veritable gardens, containing all the varied forms and bright colours of the tropics. They are thick with olive groves, orange and lemon trees, palms and almond. Fig trees and locust trees grow in rich profusion, and, above all, there is a wealth of brilliant flowers and tropical plants which will justify the happy appellation of the “Conco d’oro.”

Within the town itself are beautiful public gardens, which give quite an Oriental aspect to the place, and visitors are also permitted to enjoy the private gardens attached to numerous villas and palaces, many of which are so situated as to command the most magnificent views.

The Cathedral is an imposing edifice, with very picturesque surroundings. It was built on the site of an earlier mosque in 1169, when the Normans were in power, and there is a strong tinge of Saracenic character in it which influences even the distinctly Gothic architecture of the beautiful southern porch. Further description is, however, unnecessary, as the exterior of the building will be well illustrated on the screen.

The interior is mainly interesting on account of the “Tombs of the Kings.” Here will be found the monument of Roger (first king of Sicily) and of Constantia his daughter; of the Emperor Henry VI., and other royal personages.

The King's Palace (containing many noble rooms and much mosaic ornament) is quite adjacent, and the roof of this building commands a justly-celebrated view of the city and the bay.

Reverting to the Cathedral of Palermo, interesting as it may be, it has to yield the palm to two other architectural "gems." It is not desirable to hang disproportionately upon matters architectural, still these buildings claim some little attention. They are the Cathedral of Monreale (four miles outside Palermo) and the Capella Palatina (within the Royal Palace). Few will visit Palermo without climbing the hill to Monreale. It is a delightful excursion, and the road commands magnificent views. The exterior of the cathedral is not particularly attractive, though its tall apses, with interlacing Saracenic arcades, are very imposing. The glory of the place is its interior. Though it is of immense size and much after the plan of the Roman Basilica, the real interest is the golden blaze of its matchless mosaics. In this building "Roman colonnades, Greek sculpture, and Saracenic and Norman details" are curiously interspersed; but everything is subordinated to the pride of the edifice in these Byzantine mosaics which cover almost every part. Those familiar with St. Mark's at Venice, especially if they have been fortunate enough to see it when the sunlight streams through its western windows, will understand (this cathedral being three times the size) how the assertive power of these masses of Oriental decoration will swallow up everything else.

The second great feature of interest is the splendid cloister—170ft. square. The pointed arcade is supported on coupled columns, many of which are richly carved and encrusted with mosaics. At one angle (surrounded by an arcade exhibiting capitals of marvellous beauty) is a marble fountain of such pure Saracenic character that it has been rightly regarded as a sort of "monastic Alhambra." It is, indeed, very charming, and from this point is afforded one of the finest cloister views in the world.

We must, however, be sparing of our superlatives or no sort of justice will be done to that "gem of gems," the Capella Palatina before mentioned. This loveliest of chapels is very small after Monreale—not one-third the length—but it has a gorgeous Saracenic roof, its pillars are all of rich toned granites or marbles, the floor is inlaid with circles of serpentine and porphyry, and delicate mosaics cover the walls and apsidal domes. "Not a square inch of the surface—floor, roof, walls, or cupola—is free from exquisite gemmed work or precious marbles!" Symonds says: "Some of the Ravenna churches are more historically interesting, perhaps, than this little masterpiece of mosaic art; but none are so rich in detail or lustrous in effect." I wish it were possible to bring it before you, for it is simply indescribable! Hare says (and he never loses his head in these matters)

it "produces an ecclesiastical *coup d'œil* unequalled in all Italy!"

There are many other churches of great interest, particularly La Martorana which has a Norman tower and more mosaics; S. Giovanni degli Eremiti, with its quaint Arabic domes and a graceful little cloister covered with trailing plants and flowers.

Then, leaving churches, there is the exquisite artistic subject of La Zisa, one of the remaining Moorish villas. The owner seems to have been abundantly satisfied with the position of this villa, judging from an inscription (inspired doubtless by the view from the tower) which says: "Europe is the glory of the world; Italy of Europe; Sicily of Italy; and the adjacent plains the pride of Sicily!"

We must not omit to enter the fine court of the Museum, for, amongst numerous works of art, here lie the celebrated Metopes of Selinus. They were carved in the seventh century B.C. They are grotesque and stiff, but are considered as representing most precious specimens of the earliest known Greek Sculpture. Some critics can see in them "a lively and artistic creative power;" an "evidence of great energy of representation;" "a just observation of life;" "a certain bold freedom asserting itself in spite of all the strict fetters of style," and so on. To the untutored eye they are certainly formless and heavy, and the quality which Mr. Oscar Wilde would term "swiftness" is conspicuously absent. They are distorted, awkward, and stiff-kneed; but, as representing the "earliest attempts at composition, the first strivings after life and movement," they are of the highest value; for upon this foundation was built the incomparable grace and chaste beauty of the sculpture of the Greeks—the highest walk of art.

By an easy and natural transition we come to another study in antiquities—not Greek. Those curious in *post-mortem* phenomena will visit the Convent of the Cappuccini. Some of my hearers have doubtless visited the little church of this community off the Piazza Barberini in Rome. There, however, ladies are carefully excluded, and with some I believe this is rather a sore point. The monks of this admirable Order are, however, more polite at Palermo, and they have a great deal more to show. Here are numerous long corridors underground, containing thousands of bodies. They evidently practise some form of embalming, for they are wonderfully well preserved.

A short time ago we were much interested with accounts of "Pharaoh in the flesh," and it is likely that there is some connection betwixt the burial customs of the Cappuccini and those of Ancient Egypt. Monachism had its rise in Egypt. In the second century, the mountainous district east of the Nile Valley was the favourite resort of those who betook themselves to a

life of solitary asceticism. One of the frescoes in the Campo Santa at Pisa represents their rock caverns and little hermitages surrounded by date palms, with the Nile in the foreground. St. Anthony occupied a ruined castle in the Nile district in the fourth century. It is extremely likely that these early traditions have clung, in a special manner, to the order of the Capuccini. They are a branch of the Franciscans, and their self-denying labours entitle them to the greatest respect.

The bodies are variously disposed, but hundreds are suspended from the walls. Some are in ecclesiastical robes, others are richly clad, indicating high social position. The rest are in coffins, with one side exposed, or are enclosed in chests and trunks bound in iron and brass. It is a sight to haunt the memory and few (being last up the staircase) will fail to glance back over the shoulder, apprehensive of the cold clutches of some whose broken chests suggest a determination to burst their bonds, and resent an intrusion into what ought to be the quiet chambers of the dead. After this something more breezy will be found refreshing!

Sitting, in the morning light, in the beautiful gardens of La Flora, which are close upon the bay, Monte Pellegrino dominates the whole scene. The visitor is particularly struck with the appearance of certain zig-zag lines crossing and recrossing the gorge in its centre. At points there are numerous arches, and it suggests a very steep climb. It is the pilgrims' road to the Shrine of St. Rosalia. An artist would journey there in the afternoon, when the sun lights up the eastern landscape, in the certainty that those mountain recesses and steep cliffs would form magnificent foregrounds, and would "frame in," so to speak, the noblest scenery of the bay. The Sacred Grotto and Shrine of St. Rosalia, the patron saint of Palermo, is cut out of the solid rock at a height of nearly 1,500ft., and here is a most exquisite and life-like figure, in a golden robe, by the Florentine Tadeschi. All around are votive offerings. The saint is held in the highest veneration, and thousands visit the shrine each year. This road, as may be supposed, has been the scene of many exciting acts of brigandage, the pilgrims offering "fair game" for this picturesque form of highway robbery. Up to seven or eight years ago it was necessary to station soldiers along this road, as well as on the more-frequented road to Monreale. Certainly acts of brigandage have occurred very recently, but brigandage, as a business or romantic pastime, is about "played out." The popular idea pictures the despatch of an ear, in a registered letter, to the family of the captive, with a polite intimation that the head will follow unless a few thousand pounds are immediately forthcoming!

The last incident of the kind I heard of was concerning a lady, who, after the arrival of the first ear, quickly smothered

her grief and set about collecting the sum required. Such was her want of success that other outlying portions of the "loved one" came duly in upon her. The last item was accompanied by a peremptory threat that if not ransomed within twenty-four hours the victim's life would be sacrificed. At this the distracted wife, who had just collected the specified sum, sagely concluded on her husband's behalf that, with so many features lopped off him, life for him would not be worth living; so she left the brigands to finish him and invested the money in another spouse with all the parts referred to firmly attached to his frame!

These sensational practices are now at an end, and the well-conducted traveller, as some one has observed, will "meet with no robbers—that is, outside his hotel bureau!"

The principal ruins are all well guarded, the Government having established special depôts in close contiguity, and this blot on Sicily has been virtually wiped out. Guards will be supplied, if required, to the more remote places of interest. It may be argued that, in brigandage, the phrase is specially applicable—"it is the unexpected that happens;" but the air of Palermo breathes nothing but "peace and goodwill," and we had climbed Monte Pellegrino, wandered amongst its rocks, and got half-way down again before the idea of brigands suggested itself to the mind. At this point there galloped up a band of wild-looking men on mules, armed with guns; they, however, simply freshened the scene with life and "local colour," and, with a light joke and a merry laugh, they swept gaily past.

Ladies afraid at the sight of a gun might be liable to sudden shocks, as many of the natives carry this weapon. It was suggested that they were in search of game. They seem to take up an eligible position for the day and patiently wait for the quails to come round that way and be shot. On this principle they were generally discovered looking vacantly over a wall (minus any degree of enthusiasm), and suggesting to our minds homicide, possibly suicide, but certainly not sport. The views from Monte Pellegrino are superb! The Conco d'oro lies below, and the windings of the road give endless variations in the picture. Resting here for a moment, within sight of the Church of St. Spirito, we may tell, in a few words, of just one historic incident. The French, under Charles of Anjou, ruled the island and were much hated by the people; and a single incident, falling like a spark upon a prepared train, caused a most terrible ebullition of Southern passion.

As the bell of the church just mentioned was ringing for vespers, on Tuesday, March 31, 1282, a French soldier, named Drouet, insulted a Sicilian maiden. When her lover raised the cry, "Death to the French," the infuriated crowd, armed with knives, clubs, and sticks, fell with such desperate energy on the

French that they killed them to a single man. Thus began the general massacre called the "Sicilian Vespers." No convent or church served as a refuge. The French were hunted down through the whole island. Not a Frenchman, except Wm. de Porcelet, was left. The revolution made a profound sensation throughout Europe, and has become "proverbial for an act of sweeping and terrible revenge."

Descending the mountain the scene was enlivened by herds of goats and cattle—the former afforded much amusement by their feats in climbing, jumping, and general playfulness. When these goats (carrying the milk supply of the city) get into the streets they are more sedate, but continue (grouped about on the steps of the churches and other picturesque positions) a source of interest and charming variety in the busy town-life. Out of such sights and unique experiences the traveller gets endless satisfaction in Sicily, and especially in Palermo.

The quaint bullock-wagons, the agile water-carriers, the picturesque costumes (especially in children), the gaudy mule trappings, the painted market carts (the panels, triptych-like, full of sacred subjects)—these, and a host of kindred accessories, present, to the alert eye, a series of subtle charms more easily felt than conveyed.

All who have travelled in the South must admit the immense power on the mind of the novel pictures and impressions coming through the elaborate ritual, the quaint religious customs, as well as the splendid fêtes associated with the Romish Church. The scenes within and adjacent to the many churches, and around the roadside shrines, will fill a large space in the round of Sicilian reminiscence. Many of these living pictures strike powerfully on the imagination; it matters not whether they are from the church or the street, whether related to the prince or peasant, they will rise to gladden the mind long after mere architectural form or local tradition has been forgotten. They have inspired some of the finest work of the finest artists, and it is no wonder that they act with mysterious power on the lay mind.

Leaving Palermo the railway affords beautiful retrospects of scenery round the bay. Bagaria, eight miles on the journey, contains many noble and, for the most part, deserted villas of the Sicilian aristocracy. Near here are the Greek remains of Soluntum—further east the fine Norman Cathedral of Cefalu, but we must hurry on to Girgenti. It is an interesting ride of about five hours.

GIRGENTI.

The Greeks came out from Gela (where they settled and built up a city about 700 years B.C.) and founded Girgenti 582 B.C. It was a noble situation, happily chosen. The city was

built upon an immense platform, defended by precipitous rocks, the highest point being 1,200ft. above the sea. The city has been twice taken by the Carthaginians. It has been in the possession of the Romans, the Saracens, and the Normans; but the time of its greatest prosperity and grandeur was betwixt the years 480 and 403 B.C. In the former year Theron, the tyrant of Acragas (as it was called during the Greek period), allied with his brother-in-law, Gelon, tyrant of Syracuse, who won a glorious victory over the Carthaginians at Himera; this was one of the great battles of history, and from that time till 403, when (after seven months' siege) the Carthaginians took Acragas and destroyed most of its temples, the city rose to a pitch of splendour and importance almost unparalleled.

It had a circuit of ten miles, and, according to a census mentioned in the writings of Empedocles, the population exceeded 800,000. Pindar says that it was "the most beautiful city of mortals." The inhabitants lived in the greatest luxury. One writer of the time says, "They built their houses as if they were to live for ever, and they ate as if they hadn't another day to live." We know of the sumptuous character of their temples by what we can now see of their remains. These buildings were filled with the finest statues and paintings of antiquity, and we hear of Myron's beautiful statue of Apollo, the brazen image of Hercules, and other famous works.

Special mention is made of the most precious paintings of Zeuxis, representing the Infant Hercules, and the Goddess Juno. In dealing with the latter subject, Zeuxis (after the method of the Greek sculptors) had brought before him the most beautiful women of the city, and, selecting five of the most charming, he combined in his figure the special excellences of the whole, and produced what was regarded as a perfect dream of feminine loveliness. The interest the people felt in these works of art is shown in this; that when Verres, the celebrated Roman Prætor (a most rapacious "collector"), attempted to take away the Statue of Hercules from the temple; Cicero (who wrote most indignantly about his vandalisms) says, "No one was too old or infirm to seize a weapon and come to the rescue," and they actually put the Roman soldiers to flight. The wealth and importance of the city is shown in many ways. Aristhines, a citizen, in celebrating the nuptials of his daughter, caused the bride to be followed by 800 chariots, and the whole city was illuminated. Diodorus says that one of the citizens, returning triumphantly from the Olympic games, was met by a train of 300 cars, each drawn by four white horses, sumptuously caparisoned.

Much more might be said about the glories of this grand old Greek city, but we must now visit the few remaining fragments of all this magnificence; and, in doing so, we shall be at once

struck with the consummate skill with which nature and art are made mutually to enhance each other. The natural features are boldly picturesque, but art has stepped in with such vivifying grace that the temples form a glorious adornment to the scene. They stand mostly on the edge of the rocky rampart towards the sea and about two miles from the town, and their exalted position and wild surroundings greatly assist the sensation of veneration and awe with which the Greeks manifestly strove to invest their sacred buildings.

Speaking generally, the Sicilian temples are the finest outside Athens, and in point of size are exceeded by none excepting the Temple of Diana at Ephesus, which was 388ft. long. The Sicilian Temple of Selinus was 371ft. long, and the Temple of Zeus, at Girgenti, 356ft. The Parthenon, at Athens, is 229ft. by 101ft.

The temples of Girgenti are the best preserved, and the Temple of Concord is probably the most complete of any in Europe. The Temple of Juno is a most picturesque ruin, as is the vestige of the Temple of Castor and Pollux. The monster Temple of Zeus was never completed. It stood nearly 120 yards long, with a breadth of 60 yards, and stood 40 yards high. It was destroyed by an earthquake, but huge fragments speak eloquently enough of its former grandeur.

Sections of the columns lie there 14ft. in diameter, with flutings large enough to contain a man. In the centre of the "cella" lies a gigantic figure, 27ft. high, which doubtless formed one of the colossal caryatides flanking the entrance. This ruined building formed a quarry out of which the Government built the mole at the port of Girgenti, and there is a good deal of it left.

There are the remains of seven temples in all, and there is a remarkable monument called the Tomb of Theron. Up to thirty years ago the basis of the beautiful proportions and general symmetry of the Greek temples was a mystery, but about that time Mr. Penrose, an accomplished architect, discovered what are known as the "curves of the Parthenon," and subsequently of other Greek buildings.

In buildings of this order (or any order for that matter) considerable deflections are produced by contrasting lines, and the Greeks had addressed themselves to correcting these disagreeable optical illusions. It was found that there was not a straight line in these Greek buildings. Not only was there the entasis or swelling in the body of the shaft, but the axes of the columns were not perpendicular; they inclined inwards at various angles. The mouldings of the pediments, the cornices, the steps of the building were all on the curve. Scarcely any two of the capitals were exactly of the same size. There were slight inclinations in many presumably perpendicular lines. By these means

the necessary optical corrections were effected with the most excellent results. The extra care and study manifest in design, and the patient and persevering effort required in execution, show what capable and conscientious artists these old Greeks were. Their workmanship was excellent; they put up their buildings in the block, and wrought them into shape after. Many of these unwrought blocks are observable in the uncompleted buildings in Sicily; and, as at Segaste, the smooth round columns show that they had found no time to cut out the flutings. At Selinunto the great temple was never finished, being interrupted by the Carthaginians, and visitors can go into the quarry and see the actual stages in preparing the stones;—huge drums of stone for the shafts being half quarried, and others (lying about for transport) correspond with those used in the temple structure.

The present city of Girgenti has about 26,000 inhabitants. There is a cathedral, but it is of no great interest. They have, however, treasured here one of the finest specimens of Greek sculpture in the form of a magnificent sarcophagus in alto-relievo. The town is very quaint, but, after taking the tour of the Greek ruins, it evokes little interest.

The scenery is of the highest order, and the views, which are very lovely, rank next after those at Palermo and Taormina. It has often been remarked that the colour here is unspeakably delicate and ethereal, both on sea and mountain. Lovers of natural phenomena will visit the mud volcanoes of Maccaluba, but we found no opportunity of doing so.

It was a glorious morning on which we left the hotel at Girgenti, at about half-past four. We had an hour in which to drive to a train, a mile and a half off, and yet the establishment had been in quite a panic over the dilatory start. In Sicily nobody is in a hurry; they exist in a state of lazy contentment. The Sicilian horse has intelligence enough to see this, and occasionally to take advantage of it. A lady visitor informed us that the animal under observation often stops in the road and refuses to move—and the driver, considerably accommodating his humour, patiently waits his willingness to recommence the journey. These equine peculiarities and similar contingencies (such as a corresponding lassitude in the slow-moving biped who registers the baggage) have to be duly allowed for.

The journey from Girgenti to Catania presents points of great interest, of which I can only mention two. The first is the deep gorge betwixt two rocky mountains, in which are situated the old cities of Calaschibetta and Castrogiovanni. The latter is built on the site of the ancient Enna, and stands 2,600ft. above the sea. Travellers, unable to stay here (looking back at these rocky nests), must feel great regret, for they promise much of romantic interest; but speedily the mind will be filled

with nobler sights, for it is at this point that the first view is afforded of the graceful outlines and the snowy peak of Etna. From this time (until Sicily is left entirely behind) the mountain towers over everything. Though not always in view, its presence is felt, and its majestic form centres many a fair scene during the rest of the journey.

CATANIA.

Catania in itself has no startling attractions. It has fine squares and one of the most imposing streets in the world. The great square of the Duomo presents a very good effect, and is centered by an obelisk sustained on an elephant. This is supposed to allude to a victory over the Carthaginians. The Benedictine Monastery is the most interesting building in Catania. The monastery was dissolved in 1866, and it is now used as an educational institution, having a picture gallery and a library containing 20,000 volumes. From a window at the rear is one of the finest views of Etna, and it is curious to see (though the cone is 25 miles away) the edge of a deep lava stream of 1669 just a few feet from the building. The stream stopped here and flowed on at the side, enclosing the monastery like an island—a fact accounted for through the miraculous power of St. Agatha. The view of Etna, as we saw it, was truly entrancing. It lay clearly outlined against the sky, yet so softened by distance (its aerial blue fading into the snowy summit, on which lay a white smoke cloud) that it seemed more mirage-like than real, and suggested nothing of the devastating and desolating power the evidences of which lay thickly around. Driving along the Via Etna frequent glimpses are obtained of this magnificent mountain.

Etna demands a paper to itself. All the particulars concerning the ascent were procured before our visit, but the circumstances were not favourable for the ascent, which takes two days. The distance is 30 miles, and the night must be spent in a hut, the Case Inglese, at a height of 9,600ft., and close under the cone. The height of Etna is near 11,000ft., and the extreme cold after leaving the hot plains below is felt most keenly. The best time for the ascent is a moonlight night in the summer. The view of the sunrise from the summit (throwing, as it does, a great purple triangular shadow over the island) is a sublime spectacle and quite beyond description. The ascent reveals numerous craters, old and new—that of Monte Rossi, 3,100ft., being the most visited. On the east side of Etna is an awful chasm, the “Valle de Bove,” three miles wide, and bounded by sheer cliffs 2,000ft. to 4,000ft. high. There is no time to give an account of the eruptions, and, not having made the ascent, further notice is scarcely justifiable, though it is admitted that the best account has been written

by a man who never went up! We saw enough of Etna, however, to be most powerfully impressed by its awful grandeur, and to long for the chance of a closer acquaintance.

SYRACUSE.

Syracuse, says Cicero, was "the largest of Greek, and the most beautiful of all cities." Receiving this declaration with some little abatement, there is no doubt about the extent and magnificence of the old city. Its walls had a circuit of $22\frac{1}{2}$ miles. It contained many sumptuous temples, spacious squares, fine galleries, magnificent streets, immense gymnasia, large theatres and amphitheatres, and many noble works of art, especially a most beautiful statue of Apollo. A known population of 500,000 supplies the life to this remarkable picture, and now the vast area on which the city stood is but powdered over with the slight memorials of its ancient greatness, and the visitor treads on the mere dust and rust of "twice ten hundred years."

The city was founded by Corinthians 734 years B.C. It speedily rose to power and threw off many colonies, becoming, itself, the most powerful of the Sicilian States. It attained to the summit of its glory in the fifth century B.C. The great event of this century, and one of the most remarkable events of all history, was the invasion by the Athenians—ending in the great battle of Syracuse.

The present-day interest in Syracuse is so inseparably associated with this event that we must here briefly recapitulate the circumstances. Syracuse having attained to great power began to oppress the neighbouring states, and the consequence was an appeal to Athens for assistance. The Athenians, fired with an ambition of conquering Sicily, were (chiefly at the instigation of Alcibiades) induced to send a powerful force against Syracuse in 415 B.C. The incidents which followed are most dramatic. For a time the Athenians were successful, but Alcibiades was recalled to answer a charge of sacrilege, and, being condemned to death, he managed to escape, remarking that he would give them good cause to know that he was alive. Fleeing to Sparta, he—the man who had been mainly instrumental in stirring the Athenians to the attack—now succeeded in persuading the Spartans to send out an expedition to the relief of the Syracusans. If a successful plan of revenge can ever satisfy the human mind, Alcibiades ought to have been a happy man! The city was on the point of capitulating when the Spartan general broke through the Athenian wall, parts of the city were recaptured, the Athenian land attacks were repulsed, disease broke out amongst them, dissensions arose amongst the generals, and retreat was determined upon. This could, of course, only be accomplished by the ships, and from this point

the Syracusans became the besiegers. All interest was now centered in the great harbour. The Syracusans blocked the mouth by mooring vessels across it. The Athenians then entered upon this struggle for "dear life," and tried to break the blockade. The land armies occupied different sides of the harbour, and everybody turned out to see the fight. On both sides the people shouted their exhortations, and hurled reproaches against any ship which appeared to flinch. Factitious stimulus was little needed, for both fleets displayed the most heroic courage, and for many terribly anxious hours the result was doubtful—"sometimes Syracusans, sometimes Athenians prevailed." According as success thus fluctuated, so followed the cheers or wailings of the spectators ashore. It was amongst the Athenians (whose life and liberty were staked in the combat) that this emotion was exaggerated into positive agony. The effect of these stimulating shouts from side to side is graphically described by Thucydides as representing the surging of a dramatic chorus. Wailings and lamentations rose above the din of battle; but when, at last, victory began to declare in favour of the Syracusans, and their ships were driven in to the land, there arose from the Athenians one unanimous shriek of agony and despair. These cries were mingled with the wild shouts of delirious joy from the city and the conquering ships. The Athenian army commenced a retreat, but eventually all were captured, and 7,000 were sent to languish and die in the Latomia of Syracuse. Thus ended one of the most thrilling incidents of all warfare, and thus was "the power of mighty Athens shattered against the walls of Syracuse, never again to recover its ancient prestige."

The Syracuse of to-day is a strange place, full of strange people. Its streets are mere cracks, and in many of them it is impossible to turn a carriage. It is, however, undoubtedly, the most interesting place in Sicily, and the scenery in its vicinity is very fine. Immediately on our arrival we were waited upon by a celebrated guide named Felice: he bore the highest testimonials from some of our distinguished countrymen, mostly yachting people. Syracuse did not promise much in the way of carriages, and on his appearance in the morning we were astonished, on looking over the balcony, to find that, Aladdin-like, he had produced a magnificent pair of bays, a carriage (apparently new) lined in light-fawn colour, and a dignified-looking driver with a cockade. Our confidence in Felice rose when we found that he had so correctly estimated the importance of the party, and in this sumptuous and incongruously slashing style we made our pilgrimage through the mouldering ruins of the ancient city!

We had a straight and uninterrupted drive of nearly six miles to the Fort Eurylus, the crown of the Epipolæ. There the

field of interest was spread before us to a distance of some eight miles beyond the great harbour—the scene of the battle. Immediately in front were the five portions of Ancient Syracuse, ending in the Island of Ortygia. The fort on which we stood is one of the most remarkable of Greek remains. It stands on a rugged rock and forms almost a complete castle. The visitor can traverse chambers and passages cut out of the solid rock, and here are courts for horses and troops, fosses of defence, embrasures, and galleries, all cunningly conceived, and representing the military engineering of twenty-two centuries ago.

The Walls of Dionysius are clearly seen from this point, and walking upon them, the visitor is amazed at the inconceivable energy and endless resources upon which they were built. Dionysius had learnt a lesson from the Athenian siege, and when Himilcon (the Carthaginian general) began his march on Syracuse, the walls must “rise like magic.” He had 70,000 free men and tens of thousands of slaves at work, with 6,000 yoke of oxen. This grand old tyrant urged on the work with mad impatience. The walls were 9ft. wide and were guarded with towers of defence, all of uncemented but closely-jointed stone, and in twenty days they extended three miles—a feat of building to which there are few, if any, parallels.

Like Mrs. Elliot, in visiting the numerous remains in Syracuse we were “see-sawed” all over history—Phœnician, Grecian, Roman, Sacred—and it will be quite impossible to do more than mention the chief points of interest. First amongst these is the Greek Theatre, built by the refined and artistic tyrant Hiero I., five centuries before Christ. It is hewn out of the rock and seated 25,000 spectators. In some of these seats we see, clearly cut, the names of the occupiers—Hiero, Queens Philistis, Nereis, etc. Here sat also the great Dionysius, who amidst all his ambitious schemes maintained a great love for poetry and wrote verses himself.

Then there is the famous Roman Amphitheatre and the celebrated Altar of Hiero. Close by the Greek Theatre is the “Street of the Tombs,” the numerous chambers being chiselled in the face of the rock.

Near here, too, is the *Latomia del Paradiso*. The *Latomie* are really ancient quarries; there are several of them in Syracuse which are now covered over by a luxuriant vegetation and are gay with flowers;—they are indescribably beautiful. In the *Paradiso* is the grotto called the “Ear of Dionysius,” bearing the traditions of his masterful mind. In the *Latomia Cappuccini* the 9,000 freemen, the flower of the Athenian army, were left to rot and die!

Near this cavern is the Church of St. Giovanni, beneath which is the Crypt of St. Marcian, and here tradition says St. Paul prayed and preached.

Close by are the Catacombs, on a plan and scale resembling a city with streets and extensive squares; they have been attributed to all nations in turn, and Felice had a theory, owing to the presence of certain débris, that they were there before the flood! They are, however, much more interesting in themselves than those at Rome or Naples, and, extending many miles, are very intricate. Twenty years ago a professor was lost there with six of his pupils. They wandered long and despairingly in search of the entrance, and were found dead at a distance of four miles from the gate.

The town has a few sights to show—the Cathedral (a Doric temple built up betwixt the columns), the Temple of Diana, the Fountain of Arethusa, the Museum, etc.

Outside the town to the south are several interesting ruins. There is a charming boat excursion up the River Anapo, where rise lofty papyrus plants—planted by the Arabs.

Syracuse would enchain the interest of an ordinary traveller for a week, and the classical student would never tire of its sights and associations. We left the place with feelings of the greatest regret. The view over the graceful curves of the Greek Theatre, including the harbour in deepest blue, and the picturesque outline of the white town, will not soon be forgotten.

The journey from Syracuse to Catania ought to be done in the evening. Etna shows to the greatest advantage for most part of the way, and, despite the fact that the summit is some 40 or 50 miles off after rounding C. Campoloto, it seems at times to rise sheer out of the opposite side of the bay. The evening effects are superb, presenting a perfect symphony in colour; as a certain writer says—not over fond of pure Saxon—"a more magnificent succession of post-meridian, vespertine, and crepuscular views" is not to be found anywhere else!

The coast line from Catania to Messina is scarcely less interesting, including, as it does, nearer views of Etna. The whole air seems "fragrant of mythology." The home of Acis and Galatea—of the one-eyed Polyphemus. The beautiful ruined castle (Aci Castello) comes into the view, and the rocks of the Cyclops are close in to the shore. The line being close to the sea, there is a charming succession of pretty pictures on both hands.

"Now the blue ocean, and now chaos-like,
Mountains and mountain gulfs; and, half-way up,
Towns like the living rock from which they grew."

This description applies especially on approaching a station called Giardini. Here one appreciates that delicious excitement due to the inability of the human eye to take in the changing beauties of the view as fast as they present themselves; and this may well be so, for those castle-crowned rocks

encircle and look down upon the fairest spot in all Sicily, and this is just the foretaste of the glories in and around Taormina!

TAORMINA.

Taormina is perched so high up above, and yet so close upon, the Straits that a long and circuitous carriage drive of three miles is necessary. The views from this winding road are splendid all the way; and when the rock-built Taormina is reached it is found to be indescribably picturesque—full of quaint corners, quaint colours, and quaintly dressed people. There is more of Greek and Oriental suggestion here than in any other place in Sicily. The water-carriers, like so many dove-eyed Rebeccas, are everywhere. Lithe and handsome they stand erect, balancing the large amphoræ on their heads, and, moving along with stately grace, are exceedingly attractive. The majority are young girls, and the variety of soft colour in their dresses renders them like so many living pictures by Tadema, and here one feels that he has discovered the fount of that painter's inspiration in colour at least. As to their faces, he has never in his works approached such beauty as these girls exhibit—with soft black eyes, calm as the light cloud on Etna, they suggest alike a slumbering fire, and are, in short, simply bewitching.

The scenes at the water-fountains (for there is always life there, in Southern towns) are likely to live long in the minds of those who see them. One of these fountains is especially characteristic and picturesque. The traveller is not likely to allow any of the street attractions to detain him long, for the claims of the Greek theatre are irresistible, and he will wish to feast his eyes on what many experienced travellers have not hesitated to describe as "the finest view in the world."

It is simply impossible by pen or pencil to do justice to this view. Seated on the topmost tier of this old Greek ruin—east, west, north, south—it is beautiful in every direction, but the noblest features of the general landscape seem to be collected and clustered together to the south-west, and such a view as is here presented has probably no equal;—certainly there is nothing like it in Italy. Views at Sorrento, Amalfi, and Capri are tame to it. It is not simply a combination of grand natural objects, but it has that in it of refined association which employs the whole of the faculties of the mind. Whilst gazing on the actual scene the thoughts are carried along the fairest paths of all time. Speaking, as I felt personally, I never hope to be so profoundly moved and abundantly satisfied with what art and nature combined can produce for the delight of man in form and colour as I was on a certain April day on this spot! It is an inestimable privilege to see it, and may be counted on as a

never-failing source of pleasant memory and reflection through any natural lifetime.

The Theatre of Taormina was founded by the Greeks, and finished by the Romans. It seated 40,000 persons, and is cut out of the solid rock. Looking across the ruined "scena" (which is flanked by broken Corinthian columns in time-stained marble), the snowy peak of Etna (clear against a sky of turquoise blue) centres the view, the grand lines of the mountain touch the sea, the mid-distance is filled in with rocky ridges (many clothed with pines and olives), and in the foreground the town, with its white towers and many-gabled houses, glints in the sunshine. Deep down to the left, beneath steep rocks (divided by great purple ravines), lies the sea—slumbering in deepest blue. To the right, high up on towering cliffs, are the towers of the Saracenic citadel; and higher still (2,100ft.), further to the west, is Mola, eyrie-like, built on a rock which overhangs the valley. Turning round to the north is a view of the Straits of Messina,—the rock of Scylla terminating the long perspective. To the east the magnificent mountain outlines of Calabria. These are the main features of the view.

To give any adequate idea of the colouring in this magnificent view, the long lines of receding blue (wonderful in sunlight and more wonderful in the shade), is quite beyond my powers. It would be mere presumption to attempt it. My advice is—Go and see it!

The great sight of the sunrise from Etna barely exceeds in grandeur that to be viewed from the Theatre of Taormina; indeed, as regards real beauty of effect, it will scarcely equal it. If my hearers will picture the scene as just described, the whole "dyed in rich purple undertones of colour," till, suddenly, the sun fires the proud peak of Etna, and then, quickly illuminating every craggy height in succession, brings out all the rich colour of this glorious scene;—they will enter into the pleasurable excitement we felt in the prospect of this wonderful spectacle.

We made careful arrangements on the previous evening, and at five o'clock in the morning muffled figures might have been seen pacing the highest tier of the old theatre, and this is what they saw—for I made a careful note of it. At first dark grey hills to the coast towards Messina, the sea as glass, and the mountain peaks of Calabria standing dark against the rosy horizon. Suddenly, as if by magic, there rose straight from the sea wondrous filmy vaporous clouds; then sprang up a light breeze which wafted these into the deep valleys; for a few seconds the various peaks loomed out of this sea of mist; presently Etna and Mola were obscured;—the whole prospect was blotted out! The wind rose, the wreathed mist invaded the very theatre till there was nothing left for us but the contem-

plation of our own rueful faces, and all this in much less time than I have occupied in describing it. Looking again to the East a hazy blur showed where the sun had risen; then came bars of yellow and red, with vigorous struggling rays, which reminded one of Mark Twain's humorous description of a Turner's sunrise;—"like a tortoiseshell cat having a fit in a dish of sliced tomatoes." Then more light, and an opal-like sky—our hopes rising; then more vapours encircling round, the sun meanwhile making a gallant fight, with curious chromatic accompaniments. He presented, however, but a weary, bleary aspect, and finally (stifled in yellow mists) disappeared altogether. Light mists reappeared, and after a weird, mocking, dance (developing into wildly fantastic shapes), solidly filled up the entire scene, finally thickening into a respectable London fog. Chilled to the bone, cold and clammy, "eating out our hearts in a comfortless despair," we sorrowfully departed.

With this description I must close my paper. We had a short stay at Messina (a beautiful city—the home of Beatrice), and crossed the Straits just below Scylla and Charybdis, and, taking the train at Reggio, commenced the long journey to Salerno. The line affords most beautiful retrospects of Ætna. When the island was closed from the view there remained the consolatory attractions of Amalfi, Sorrento, and the best that Italy can yield. But Sicily still reigns supreme!

A Recovery in Ashango-Land.—A letter from West Africa, printed in the *New York Sun*, of May 22, tells the following story concerning the baggage lost by the explorer, Paul B. Du Chaillu, during his running fight with the Ashangos. The letter says: "These goods had never been disturbed. The natives, on going to the place where the goods were dropped, say that some of the boxes began to talk. They doubtless referred to one of the music-boxes which were among Du Chaillu's presents for the native chiefs. In lifting a box containing one of these musical instruments it is likely that the music began to play, scaring the natives half to death. They decided that all the property of the white man was fetish, and that they and all their people would perish if they touched any of the goods, so everything was left just as it had fallen. . . . I, however, have taken away some of these interesting relics. One of them is a box containing a large magnet for polarizing the compasses. Another is a box containing a large number of English and French scientific periodicals. Mr. Townsend took away as a relic the inside of a musical box. I shall bring the relics back home to show that I have been on the ground where Du Chaillu sustained his severe defeat." Mr. Du Chaillu's account of the fight and the retreat is given in chapters xvii and xviii of his *Journey to Ashango-Land*.—*Bulletin of the American Geographical Society*.

NOTES ON THE GEOGRAPHY, GOVERNMENT, AND INHABITANTS OF UGANDA, WITH A SKETCH OF ITS HISTORY TO 1892.

Prepared in the Intelligence Division of the War Office by CAPTAIN HUBERT FOSTER, R.E., September, 1892, and published by permission of the Director of *Military Intelligence*.

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DESCRIPTION OF UGANDA.

THE Kingdom of Uganda is probably the most important, populous, and highly civilised of any non-Mahomedan state in Africa. It occupies a strip of 150 miles along the north-western shores of Lake Victoria, between the inflow of the River Kagera and the outflow of the Nile, and extends some 60 miles back from the lake. The capital, Mengo, near which is the king's residence, Rubaga, is situated a few miles from an inlet of the lake named by Speke Murchison Bay. Besides the territory round the capital, Uganda consists of the outlying provinces of Singo on the north, Buddu on the south along the lake shore, and Chagwe along the lake to the east as far as the Nile. Uganda also possesses the long chain of islands in this part of the lake, of which the largest is Sese, a richly-wooded island 42 miles long by 20 broad.

In addition, Uganda has claims, at present unrespected, to overlordship of Ankole and Unyoro, two powerful kingdoms lying to the west of, and adjoining, Uganda. These kingdoms, like Uganda, are offshoots of an empire founded between the lakes by a conquering race, the Wahuma, who crossed the Nile from the north-east into this region centuries ago, and have always furnished the sovereign line to these countries. Unyoro is a large and important country, extending along the whole eastern shore of Lake Albert, and has always been in a state of hostility with Uganda. It can hardly be doubted that the object of any power holding Uganda must be to dominate Unyoro and Ankole, and thus acquire a footing on all the lakes, and the command of the sources of the Nile.

Lake Victoria lies some 4,000 feet above the sea, so that Uganda, although on the Equator, has a temperate climate, no hotter than that of Tunis, Canton, or New Orleans, and cooler than that of Cairo, Ceylon, or Singapore. The temperature rarely rises above 90° or falls below 50° at night. The rainfall

is small for the tropics, averaging 49 inches, and it is spread over the whole year, with two marked periods of increased rain, September to November, and March to May, July being the driest month.

Uganda is situated on a plateau, rising gradually to the west, and formed of granite, with iron-ore rocks which colour the land red. The soil consists of red clay and marl, with gravel and sand, and of rich loam in the valleys. The surface consists of low, rounded, grass-clad hills, rising some 400 feet above the thickly-wooded bottoms, through which creep sluggish streams in reedy, swampy beds. On the slopes and rounded tops of these hills there are cultivated gardens, divided by hedges and fences, and rich groves of bananas, among which stand the beehive-like huts of the natives, and the aspect is smiling and pleasant. It is a well-watered and well-wooded country, with a soil of marvellous fertility, especially along the coast.

The country lying back from the lake between Uganda and Unyoro is uninhabited, and is very difficult to traverse owing to the number of sluggish rivers running through swamps of reeds towards the north into the Nile. The only practicable communication between the two countries is therefore by a detour to the south through Ankole.

ROUTES TO UGANDA.

The natural approach to Uganda has always been by water, from the south or German end of Lake Victoria, which is reached from Zanzibar through German territory. This is the shortest route in time and the easiest, as it is an old-established trade route, and no great height has to be crossed, but the nearest road would be through British territory from Mombasa, were it not for the warlike Masai, who occupy the intervening country, and the great height, 5,500 feet, of the watershed between the coast and the Nile.

This region till now has not been passable in safety without a caravan of some strength, so that no communication can be said to exist to Uganda by this way at present, although it has been traversed at various times by expeditions of the Imperial British East African Company, and of various travellers, and has been recently surveyed for a railway; no doubt, if the difficulties can be overcome by the submission of the Masai to the Company, and by the construction of a railway for some part of the way, and if steamers are placed on the lake, a direct mail and trade route to Uganda would run from Mombasa to Uganda through British territory. When this is the case mails might reach the lake in 24 days from Mombasa, and caravans in double that time. At present it is four months' journey to Uganda by this route.

GOVERNMENT.

The government of the country is nominally in the hands of the king, who is absolute master of the lands and persons of his subjects, but the power really lies with the great council, in which all matters of state are discussed, decisions made, and judicial work carried on. This consists of the king and the *katikiro* or grand vizier, the *bakungu* or greater chiefs, and the leading *batongoli* or lesser chiefs, with some court officials.

The *bakungu* or greater chiefs hold certain districts as fiefs, on condition of military service, and under each are certain lesser chiefs, *batongoli*, who hold land on the same tenure, bringing with them to war the peasants, *bakopi*, on their lands, who furnish the soldiers who have built up the military power of Uganda. These classes have no very sharp divisions, and individuals rise and sink constantly from one to the other. All chiefs exercise judicial power of a certain degree, and there is right of appeal to a higher tribunal up to the council, or to the king himself.

INHABITANTS.

The population of Uganda proper was estimated in 1875 by Stanley at less than 1,000,000, but by the missionary Wilson, in 1879, at 5,000,000; this must be an overstatement, as he only estimates the males at 1,400,000. The inhabitants consist of two distinct stocks—the Waganda, who are Bantu negroes, of chocolate colour and with woolly hair, and the Wahuma, taller and finer, with straight noses and thin lips. The two races speak different languages, live apart, and do not intermarry; the Waganda are the cultivators of the soil and live chiefly on bananas, eating very little meat, while the Wahuma are flesh-eaters and herdsmen; they are probably an offshoot of the Galla race, like the Masai to the east of Lake Victoria, and are reputed by tradition to have come from the north-east. The royal line is of this stock.

A foreign element has been introduced during this century by Arab traders from the coast, whose influence has Mahomedanised some of the Waganda, and formed a party of that creed. In their hands is the whole trade of Uganda, and they have introduced the Swahili language, now widely spoken in Uganda, which facilitates business for travellers arriving from the coast.

The inhabitants of the lake islands are blacker and more savage than those of Uganda, and are great canoe builders and sailors, which has always given Uganda the control of the navigation of the lake; this population is very loyal to the king, and has more than once given him a safe asylum when driven from his capital.

The Waganda are a fairly civilised people, clothed from head to foot, and despising the naked savages around them. They

live in comfortable thatched huts resembling beehives, surrounded by fences enclosing flourishing gardens. Beyond these are fields of maize and banana groves, and open grass ground for grazing their cattle and goats. They are a cleanly, intelligent, and industrious folk, with healthy frames and kindly dispositions. They are all polygamists, from the king to the peasant, and the women do much of the hard work, but there are also a large number of slaves in the country. They are clever artisans, particularly in smiths' work, carpentry, and in dressing skins. They also weave cloth and make mats, pottery, and baskets, and the building and thatching of their houses, about the neatness of which they are very particular, occupies much of their time.

COMMERCE.

Trade at present is in the hands of the coast Arabs, and consists chiefly of ivory from Usoga and Usongora, salt from a salt lake of great value near Lake Albert Edward, and slaves from the adjoining ruder tribes to the south. There is no doubt considerable room for development of trade in coffee, cotton and tobacco, gums, resins, and dressed skins of all sorts, when the country is settled and a shorter route to the coast opened.

Since the arrival of the missionaries, and the rapid assimilation of the two forms of Christianity, the country has been divided between the "Protestant" and "Catholic" parties, but these are really civil factions, under chiefs who have adopted those creeds; the lower classes, often ignorant of religious distinctions, blindly follow their lords. Besides these, there is a party of the old pagan religion, who are hostile to all European teaching, and a Mahomedan party, dependent on the Arab traders, till now in exile in Singo. It is this fourfold division due to the introduction of new religions among these pagans that has caused the strife and bloodshed of late years, which will be described in the following history of the country.

HISTORY.

The history of Uganda before it became known to Europe is only given in native tradition, probably of a highly mythical character. A sketch of it will be found in Stanley's book, "Through the Dark Continent," Chapter XIV.

The first approach to Uganda by Europeans took place in 1858, when Speke, who had been exploring Lake Tanganika with Burton, reached the south shore of a great lake which he named Victoria, but did not explore further. This was the first discovery of this lake.

In May, 1862, Speke and Grant arrived in Uganda, and were well received by the King Mtesa. They had travelled from the south by land, at some distance inland from the west coast of

Lake Victoria. They discovered a northern portion of that lake, and named it Murchison Bay; this forms the inlet of approach to the capital of Uganda. They marched northward in July, 1862, and Speke, bearing to the east, hit on a great river, which he traced up stream till he found it leaving Lake Victoria over falls, named by him Ripon. He thus made certain that the Nile emerged from Lake Victoria, and both then travelled homewards through Unyoro and down the river into Egypt.

When the dominions of Egypt were pushed southward by Baker in 1872, Mtesa entered into friendly relations with him, probably because King Kabrega of Unyoro, the hereditary enemy of Uganda, was hostile. Mtesa invaded Unyoro, in support of Baker's ally Rionga, to place the latter on the throne in lieu of Kabrega, and in January, 1873, entered into friendly communication with Baker, and took much pains to try to forward letters to Livingstone.

As soon as Gordon succeeded as Governor of the Sudan he sent, in 1875, one of his officers, Linant de Bellefonds, and afterwards Colonel Long, to visit Mtesa, who received them in a friendly manner. The route from Gondokoro was to Foweira on the Nile, whence Linan marched south by land, but Long proceeded up the river till much nearer Mtesa's capital.

In 1876 Gordon sent an expedition into Uganda to found Egyptian stations there, and intended to proceed thither himself. After following the Nile, however, from Lake Albert for a considerable distance towards Lake Victoria, he found himself obliged to give up the idea and to withdraw his men from Uganda, leaving stations established in Northern Unyoro, and at Mruli on the Nile. At the end of 1877 Emin was sent by Gordon into Unyoro and Uganda, and was well received. There can be no doubt that the steady approach of Egyptian rule towards the south made a great impression on Uganda, causing considerable dread of absorption in the Egyptian domains. This perhaps caused the respectful attitude of Mtesa towards Egypt, which was not maintained by his successor on the decay of Egyptian power, as is seen by the difficulty experienced by Dr. Junker in pushing through with Emin's letters to the coast in 1886.

Having thus noted the contact of Egypt with Uganda, we will return to 1875, when a visit was made to that country fraught with far-reaching consequences. Stanley had reached Lake Victoria from Zanzibar, and proceeded to explore its unknown eastern and northern coasts. On arriving at the islands opposite Uganda he was well received, and news was sent to Mtesa, the King of Uganda, that a white man was on the way to visit him. Stanley was then escorted up Murchison Bay with some ceremony, and landed at Usavava, where he met with a grand reception, and was taken to see Mtesa at the capital,

Rubaga. Here Stanley met Gordon's envoy, Linant, who lost his life shortly afterwards in Equatoria. Stanley then continued his coasting voyage, but returned later, and accompanied Mtesa on a war against the islands off Usoga, the district along the north coast, more or less subject to Uganda. Stanley was much struck with Mtesa's war fleet and army. The former consisted of 230 canoes, the large ones being 70 feet long and holding upwards of 50 men as crew, besides as many more soldiers if necessary. The army contained 125,000 Wagandas, besides 25,000 auxiliaries of tributary kingdoms.

Stanley's opinion of Mtesa's character at that time is a favourable one. The king treated him, as he had Speke and Grant, with much kindness and consideration. A very full account of the condition of Uganda at this time is given by Stanley in his book "*Through the Dark Continent*," Chapters IX. to XVI.

Mtesa had been brought up as a pagan, but had been converted by an Arab trader to Mahomedanism, though he refused to be circumcised. This change had rendered him more humane and quieter in disposition. He showed much inclination to discuss religion with Stanley, and became at last converted to Christianity, and announced his determination to propagate that religion throughout his nation. Stanley was so struck with this opportunity for Christianizing Uganda that he wrote a letter to inform the world of the state of the case, and to implore help in the work. The result of this letter was a considerable flow of funds towards establishing a Uganda Mission, and an immediate decision of the Church Missionary Society to send out missionaries. The first of these reached the south shore of Lake Victoria from Zanzibar in 1877, and in June of that year two of them, Messrs. Smith and Wilson, reached Uganda. Smith lost his life on one of the islands, but Wilson was joined by Mackay from Zanzibar in November, 1878, while in February, 1879, a fresh party under Felkin reached Uganda from the north, having made a journey from Suakin up the Nile without much difficulty. Felkin, with Wilson, returned during 1879 by the Nile route to England, having with them native envoys, sent by Mtesa to the Queen. In 1879 French Roman Catholic missionaries first arrived in Uganda, and established a mission.

In October, 1884, King Mtesa died, and was succeeded by Mwanga, one of his younger sons, a vain and flighty youth, whose character has not changed for the better since his accession.

The new reign began with a change of attitude towards the missionaries, and marked hostility to the native Christians, which deepened into most barbarous persecution. The cause of this change was no doubt a not unfounded dread of the increase of European influence, and Mwanga's fears were soon

increased by the approach of Bishop Hannington from Masailand, towards the close of 1885. It is an old superstition in Uganda that the kingdom will one day be destroyed by conquerors from the east, and the king's fears were worked on by the Arabs, who lost no opportunity of slandering the missionaries, being perhaps rightly aware that the arrival of white men into Uganda boded no good to the slave trade, and the Mahomedan religion. When Hannington entered Usoga in October, 1885, therefore, he was arrested and executed by orders from Mwanga.

There continued during the next two years an intermittent persecution of native Christians, and intercourse with the missionaries was strictly forbidden. In May, 1886, a general massacre, with circumstances of great barbarity, took place. In June, 1886, Dr. Junker arrived in Uganda, having been sent by Emin with letters for Europe, and Mackay was able, after much difficulty, to induce Mwanga to allow him to pass to Zanzibar. This gave news of Emin, and the condition of Equatoria, and also was the means of arousing attention in Europe to the barbarities of Mwanga.

In the meantime, Mwanga's tyranny was becoming intolerable in Uganda. Being now in the hands of the old heathen party, he was equally hostile to Christians and Mohamedans, and began to form plans for the extermination of both. As these parties comprised the younger and cleverer chiefs, the result was that in September, 1888, a bloodless revolution drove Mwanga from his throne. The Mahomedan and Christian parties combined and quickly seized the power, Mwanga flying to the islands, and afterwards to the south end of the lake, where he took shelter with the French missionaries, and became converted. Meanwhile, in Uganda, a new king was elected, Kiwewa, Mtesa's eldest son and Mwanga's brother, and religious liberty was proclaimed.

The peaceful state of affairs did not last long; the Christians had got the larger share of power in the state, and the Arab slave-dealing party, who had control over the native Mahomedans, formed a plot to murder the Christian chiefs as they came from the king's reception. This was done, and the Christians being overpowered, were driven away in a body to the south. The missionaries, both Protestant and Roman Catholic, were also expelled, without personal violence, but robbed of all their possessions. The Mahomedans thus assumed power in October, 1888, and, finding the King Kiwewa refused to be circumcised, after a short time deposed him, and elected Kalema, another brother of Mwanga, in his place.

Mwanga, meanwhile, having allied himself with the exiled Christians, was living in the island of Sese, and became a centre of opposition to the Mahomedan party in Uganda. Many attempts were made to restore him to the throne, which were at last successful in October, 1889, when the Christians, under a

Protestant named Apollo, drove away the Arabs, and brought Mwanga back to Uganda.

Kalema and the expelled Mahomedans fled into the province of Singo, towards Unyoro, and made many efforts to recover their position, but the Christians held their ground in spite of these attacks.

At first the two parties among the Christians agreed fairly well; Mwanga's sudden conversion was of doubtful value, and his sympathies were believed to be with the heathen faction, so that a united Christian party was essential for dominating the country; the chieftainships were therefore divided between Roman Catholics and Protestants, the heathen party being kept from any participation of power, and Apollo became katikiro or vizier.

The Arabs, who had not been allowed to enter Unyoro, had settled in Singo, the border province of Uganda, and made many attacks on Uganda. In one of these attacks Mwanga fled to the lake again, and for a short time the Mahomedan party regained Uganda. However, Mwanga was again restored, and in November, 1889, the near approach of a caravan under Jackson and Gedge, sent by the Imperial British East African Company, gave fresh confidence to the Christian party, and the assistance of the Company was requested to strengthen the king against the Mahomedans. Jackson felt himself unable to promise this help definitely at first, but sent a flag, the acceptance of which by the king seemed to show acquiescence in the protectorate of the Company.

During 1889, while Jackson was on his road up country, a strong German expedition under Dr. Peters was making its way towards Uganda, to the north of Jackson's route. Dr. Peters pushed into Uganda in February, 1890, on the plea that he heard that Mwanga was in want of European help, and induced the king to sign a treaty, which, it may be said, the German Government subsequently disavowed. The English missionaries protested against this treaty, on the ground that Mwanga had accepted the flag and protectorate of the Company, but the non-arrival of Jackson with his force was held by the anti-English faction to have cancelled that. In March, however, Jackson announced to Mwanga his intention of going into Uganda, and Peters set out for the south, leaving Mwanga on very friendly terms.

Jackson arrived in April, and the fickle Mwanga, in fear of an Arab invasion, seems to have forgotten Peters and his treaty. Jackson, however, was unable to come to any terms with the king, and in May returned to the coast, leaving Gedge to represent the Company in Uganda.

The Company now decided to take firmer hold of that country, and appointed Captain Lugard to the command of an expedition,

which left Mombasa in August, 1890, and arrived in Uganda in December, to find the outlook there very clouded. The Protestants and Catholics were bitterly hostile, and the king was leaning to the latter, the stronger party. The missionaries were unable to keep the passions of their followers in hand, and the country was on the brink of the civil war which broke out a year later. Lugard at once determined to get a treaty made, and succeeded after much difficulty on 24th December, 1890, in getting one signed by the king, agreeing to the Company's protectorate over Uganda. The Catholic missionaries were opposed to the treaty, fearing that the English officers would favour the Protestants, and have ever since been more or less hostile to the Company. For some weeks Lugard was in a critical situation, owing to difficulties of supply, and the danger of being attacked by the Catholic faction, but on 31st January, 1891, reinforcements of men and ammunition arrived from the coast under Captain Williams, who became second in command of the expedition, and a fort was completed at Kampalla, not far from the king's palace, and near the Protestant Mission.

Lugard, being thus secure, set to work to try and settle all the disputes between the two parties, which led on two occasions to their assembling their respective forces for war. It was only Lugard's firm attitude and show of force that prevented hostilities breaking out. Gradually the king and chiefs gained confidence in Lugard's just dealing, and the situation cleared itself.

In March, Kabrega, king of Unyoro, who out of hostility to Uganda befriended the Mahomedan party in their exile, sent envoys to make peace with Mwanga. Lugard, judging by Kabrega's known treacherous character, decided not to allow this peace, and urged war with him and his allies, the exiled Uganda Mahomedans. An army was raised under the katikiro and marched into Singo, accompanied by Lugard with his force of four officers, 300 fighting men, and 300 porters, which was a great support when the battle took place. On 8th May, after fruitless negotiations, a battle took place on the Kamangoro river, at the frontier of Unyoro, in which the Mahomedans were beaten. Williams was sent back to Mengo to take charge of Uganda, while Lugard started to explore the country to the south-west, hoping to secure the services of the loyal Egyptian soldiers, who had been left behind under Selim Bey when Emin left with Stanley, and also to establish stations opening the region between the lakes for trade.

He first marched south into Buddu to get food and choose a site for the port from which the trade route to the west should start. He then proceeded west into Ankole, where the king Mtali was induced to receive the protection of the Company by treaty. Lugard thence reached Lake Albert Edward in July, where he found the salt lake, which forms an important source

of riches, in the hands of Kabrega's people, whom he drove off. He then formed a fort (Fort George) at the neck between the large lake and the salt lake, to ensure the possession of the latter to the Company. He then marched north on 8th August, taking Usongoro and Toru from Unyoro, so as to continue the Company's dominions to Lake Albert. He built another fort (Fort Edward) in Toru, at the eastern foot of Mount Ruwenzori, and then pushed on to the Semliki River. This he crossed, having heard news of the existence on the plateau to the west of Lake Albert of the residue of the loyal Egyptian troops, who had not collected in time, to leave with Emin and Stanley in 1889. He reached Kavallis, where he was well received, on 6th September, and, on the arrival there of Selim Bey, bringing other Egyptian troops who had deserted the mutineers at Wadelai, he entered into negotiations with that officer to induce him and his men to join the Company's service. After some hesitation Selim and his men agreed, if Lugard would obtain the sanction of the Khedive. The numbers thus added to the Company's forces consisted of over 800 well-armed and disciplined men, with plenty of ammunition, but they were accompanied by 8,000 wives, children, and followers.

Lugard left Kavallis on 5th October and marched homewards across the Semliki into Unyoro, where he established a post; he made another three days' journey further south, and a third 30 miles north of Lake Albert Edward, near the salt lake; a fourth was made five days' journey to the east, and a fifth two days further on in Ankole. These were all garrisoned by the Sudanese, and are intended to defend the frontier against Unyoro. The region behind them to the south and west, comprising Southern Unyoro, Toru, and Usongoro, under the Company's protection, will thus be defended against these troublesome neighbours.

Lugard returned to Mengo on 31st December, 1890, and found the hostility between the two parties approaching a crisis. In a few weeks civil war broke out, and the Protestants, the weaker party, would have been crushed by their assailants had not Lugard taken their side, and by the help of his soldiers and Maxims defeated the Catholics when they attacked his fort on 24th January, 1892. They fled with Mwanga to the islands, leaving Lugard master of Uganda, but anxious to get the king back. The sovereign is regarded with superstitious reverence by the people, and a political settlement without him would be impossible. The Catholics prevented Mwanga from returning, which he seemed ready to do, and Lugard finally attacked and drove them out of the islands, on which they retired to Buddu, thus cutting off the Sudanese garrisons.

In the meantime a party called *Futabanji* were marauding in Chagwe, and had cut off communication with Busoga. Lugard,

on 25th February, seeing that there was no further danger of attack from the Roman Catholics, sent a party of Protestants to crush the Futabanji and re-open the road to Busoga, which was effected by 4th March, and at the same time the islands, whose allegiance was doubtful, were brought over to the English side.

By the latest accounts, up to 3rd May, 1892, it appears that Lugard has restored Mwanga to the throne, and that Uganda is peaceful; the facile king has made yet another change in religion, and has become a Protestant, being assured of the domination of that party. He has also hoisted the British flag, and recognised the supremacy of the Company, which, however, in the meantime has issued from London orders for the withdrawal of their officers and forces from Uganda at the end of the year.

Lugard's arrangements for the pacification of Uganda consist in allotting Buddu to the Catholics, who are forbidden to propagandise, or appear armed, elsewhere. Freedom of religion being proclaimed, the Mahomedans have returned, and that religion has been to some extent given a preponderance in the State in order to counterbalance the Protestants.

Having thus pacified the country Captain Lugard was proceeding during the summer to England to report on these events, leaving Captain Williams in command of the Company's forces, and acting as Resident at Mwanga's Court. A caravan with reinforcements from the Company was expected to arrive in Uganda in May.

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"Through the Dark Continent" By H. M. Stanley (Sampson Low). 1885.

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"Fortnightly Review." June, 1892. "The Religious War in Uganda." By G. S. Mackenzie.

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A New Mountain Range in Benin.—His Excellency Gilbert T. Carter, Governor of Lagos, sends the following interesting communication on a recent journey into the interior: "It may be interesting to the Society to hear of the discovery of what I believe to be a new range of mountains in a little-known portion of West Africa. I have recently returned from an expedition of a month's duration to Ondo and Ilesha, two independent countries occupied by offshoots from the great Yoruba race, and speaking a dialect of the Yoruba language. Both these countries may be said to consist of a vast forest abounding in rocky hills, mostly covered with timber, but now and again one meets with a gigantic mass of solid granite too smooth, at least in its more elevated portions, to retain sufficient soil to start the germs of vegetation. These rocky hills are for the most part inaccessible, and consequently in travelling through the country it is not easy to determine its physical conformation. I was, however, able to get up to the top of one of these hills in the neighbourhood of Ode Ondo, accompanied by Mr. George Shallard, the Queen's Advocate, of Lagos. From its summit we saw one of the finest views I have ever witnessed in West Africa, and I am well acquainted with all the British colonies from Gambia to Lagos. Unfortunately, we could not get a complete view of the surrounding country, as there was a higher rocky eminence which shut out the prospect to the north and west; but bearing about south-east of our position, and at a distance of about twenty miles a fine range of mountains was plainly visible; nothing but rock was perceptible, although the lower slopes doubtless were covered with timber. In the immediate foreground there were a series of rocky and wooded hills, piled together in irregular, but picturesque confusion, and with the mountains in the distance formed a sight that I shall never forget. I should judge the higher peaks to be from 5,000 to 8,000ft. above sea level. The top of the hill from whence the view was obtained was about 1,000ft. from sea level. On my arrival at Ode Ondo I inquired of Mr. Phillips, an intelligent native missionary, whether he knew anything of the mountains in question, and he informed me that he had never seen them, but that probably they were in the Adaure country, situated about six hours in a south-easterly direction from Ode Ondo (this would be about eighteen miles). He mentioned that the principal town of the Adaures was on a hill, and that the natives required ladders to get to their houses. I much regret that matters of urgency required my early return to Lagos, otherwise I should certainly have visited Adaure; however, I trust it may be possible to do so later on. The only map accessible to me, giving any details of Ondo and Ilesha, is attached to a Blue Book 'In continuation of [C.—4,957] February, 1887,' and in itself is numbered C.—5,144. This map is necessarily very imperfect, and my route from Ondo to Ilesha was taken by a more direct track than that through Ife, traversed by the Commissioners. I found the source of the Oluwa river to be close to the town of Ode Ondo, and not in the Ilesha country, as supposed in the map. The Oluwa, which is a considerable stream in its lower part, owes its volume to a number of tributary streams flowing into it. The river supposed to be the Oluwa is evidently the Oni, which is reported to be of considerable size at Oke Igbo and to contain numbers of hippopotami and crocodiles. I endeavoured to get a view of the mountains from the top of a hill near Ode Ondo, and induced Mr. Phillips to accompany Mr. Shallard and myself, but after an hour of the hardest work I think I ever did we had to give it up. . . ."—*Proceedings of the Royal Geographical Society.*

UGANDA AND ITS PEOPLE¹

BY CAPTAIN WILLIAMS, R.E.

(This paper was read at the British Association, at Nottingham, and supplements Captain Foster's resumé.)

So much has been said and written about Uganda during the past year that it is difficult to say anything on the subject which has not been already thrashed out. But it has been suggested to me that interesting matter remains to be brought forward as regards the inhabitants of these regions, their appearance, and customs. I have always taken a very great interest in the people among whom my lot is thrown, and there are many reasons which make the inhabitants of Uganda peculiarly interesting at the present time. I am often asked what is the good of Uganda to us? and I invariably reply, as my first and main argument, that its value lies in its people. The men are, as a rule, tall, strong, and active; they are not generally black like most of the Soudanese tribes, but of a sort of chocolate colour. Their features, except in the case of those who have Bahuma ancestors, are of the negro type, but not of a very pronounced character. They have, of course, negro wool; but, like all well-bred blacks, they have no hair on the face. The women, as a rule, are not tall, but are very strong and sturdy, and are not remarkable for their strictness of conduct. It is easy in Uganda to distinguish this type. Where there is Matorsi blood the features are more regular and refined, and where there has been intermarriage with Wasoga or Wanyoro the skin is darker. As a nation they are temperate, and show out in bold relief when compared with the natives of Usoga and Usukuma, who are nearly always drunk. Bang, which is much smoked in Usoga, is comparatively little used in Uganda. Among the greater chiefs it is unusual to find a man who does not smoke tobacco through the pipe, which is as much at home there as it is with us.

As a nation I think they are brave, though at present they are handicapped by having given up the spear, at which they used to be very proficient, and having taken as far as possible to such guns as they can procure, and with which they are not remarkably proficient. The poorer people are industrious in their way, but have curious prejudices. A Waganda will work like a slave for his chief, carrying logs of wood, loads of food, and building cane fences and huts, but he will on no account either dig or clear the ground, jobs which he leaves to his WOMENKIND.

The chiefs are very pleasant and very polite. When you first meet them you are quite struck with their appearance, especially in their court dress, which consists of a white garment (called a Kanza on the coast) and a good many yards of beautifully clean white calico thrown loosely round them, and a small piece of the same cloth bound round the head. This sort of turban they pull off when they talk to you, and, indeed, you almost forget your friend, who is so respectful and polite, is a negro, and that you are in the centre of Africa, but let him catch sight of anything new, such as a gun, &c., his dignity at once vanishes, and he becomes a child at once. This is, however, the pleasant side. A chief will on no account do any work except repairing guns; consequently, they fill up their time by endless disputes and arguments, very often over the most trivial matters. The unfortunate religious or political factions, into which the country has been divided, have still more accentuated this fault. But, while you are often inclined to lose patience with them for their narrow-mindedness and love of litigation, you cannot help being struck by the decorum with which their

debates are conducted. The king sits at the end of a sort of lane, on either side of which sit the chiefs who are entitled to the *entrée*, shall we say? He himself sits on a chair, and he has a small carpet in front of him. Europeans bring their chairs and sit on his right, and the smaller people, guard, drummers, &c., remain in the courtyard, but where they can see all that goes on. Any chief who has a complaint to make goes and kneels at the edge of the king's carpet, and states his case. If the defendant is another chief he is called to kneel beside him, and the witnesses, if of chiefs' rank, kneel behind. Smaller people, in the same way, come to the edge of the hut. During the progress of the case, chiefs who can throw light on the matter speak or ask questions, and finally the king gives his decision, and another case comes on. If the king thinks that matters are getting a little tight, he merely gets up and goes, which signifies the conclusion of the "*Baraza*," as it is called, and everyone leaves to finish the argument outside, but there is never any quarrelling at such times; that develops afterwards. I think I have said enough to show that for negroes the Waganda represent a high type. Various theories have been brought forward to account for the presence in Equatorial Africa of a people so much superior to the surrounding tribes in appearance, intelligence, and warlike skill. It has been suggested, I think by Emin Pasha, that they are Gallas, and a French gentleman wrote to me last year asking me to examine what he was pleased to call a talisman, guarded with great veneration by the Waganda, in which he hoped to find a portion of St. Matthew's Gospel, which would prove that the Waganda were originally a Christian people who had been taught by the apostle, and had migrated south. I sent to examine the article in question, which was not guarded with the jealous care my correspondent had surmised. In a small grass hut, in a forest about twenty-five miles from the capital, my head man found a bundle of bark cloths. These he opened and discovered two skulls of the ordinary negro type, probably of a man and a woman. The native tradition is, that this is the burial-place of Kintu, the first king of Uganda, and the skulls are probably his and his wife's. It is the custom for each king, on his election, to send a bark cloth to wrap the package in over the others, so that the number of bark cloths gives approximately the number of kings of Uganda since his reign. Twenty-two or twenty-three were found, which brings us back about 350 years, or perhaps a little more.

Now, this time or anything like that would not be sufficient to so change the type if the Waganda were really Gallas. That they are, more or less, an alien race I have no doubt, as it appears to me that we can trace the older races in the Sese and Wavuma Islands, and in Toru, where they would naturally be pushed by more vigorous races. Uganda tradition says that Kintu came from the north end of the lake, but my own idea is that this is merely the somewhat common tradition of a people coming from the East, because the sun to them appears to be daily from there. I believe the Waganda will be found to have had their origin from the Wagoni Tribe, who, I understand, are a branch of the Zulus, who extend to Lake Nyassa, and I have Captain Lugard's authority for saying that there appears to be an affinity between the language spoken at Lake Nyassa and the language of Uganda, which cannot be accounted for by Swahili words entering into both languages. Again, the Waganda do not extract teeth or mutilate themselves as a tribal custom, as do most of the people to the north of the Victoria Lake, and their weapons, I think, favour the idea that they have come from the south. The old national spear of the Waganda is curious; it is very long, with a broad, tapering blade, suitable for throwing at close quarters or stabbing with.

There is another tribe, which I have only casually mentioned, which is most interesting from an ethnological point of view, that is, the Bahuma, the inhabitants of Ankole. They are remarkable for the refinement of their features and their light-

ness of build. As regards their features, they are more like Somalis than true negroes, and their language is guttural like the Somal language, but I have not been able to ascertain that there is any affinity between the two. They are essentially a pastoral people, and are the herdsmen of Uganda. They are simple, quiet folk, and, with their King Ntale, are intensely superstitious, and great believers in omens and divinations. Their women are prettier and neater than the Waganda, and are in some request as wives; but I have never been able to ascertain that Bahuma descent was a subject of pride, as I have seen stated in early books on the country. Whether these people, who are undoubtedly allied to the people of Baziba and Ruanda, came from the north in remote ages, I can give no opinion, but it is quite possible that this is the case.

It would only weary you if I went into all the details of the subsidiary tribes of the English Lake District, but I may say that I think the people of Usoga and the Sesse Islands represent, probably, the oldest races—the latter are said, and I believe with truth, to be cannibals; that the Bahuma, Baziba, and Ruanda represent the next wave; and that the Waganda are, comparatively speaking, parvenus. The people of Unyoro are probably an overflow from the Soudanese tribes of the Upper Nile, and I think the same may be said of the Kavirondo people; so much so that on my arrival there on my way to Uganda my men, composed of Soudanese of every tribe, said they had now arrived in the Soudan.

CUSTOMS.

I now propose to call your attention to the customs, peculiarities, and superstitions of the Waganda. As I have remarked at an earlier period, the chiefs are polite, well-dressed, and cleanly, and this remark may apply to the whole nation. Those who can afford it wear cotton stuffs, while the poorer people wear bark cloth over their cotton garments, though a chief's wife wears it of a special and somewhat rare quality. The effect of a mass of the people assembled is very pretty, the light brown of the bark cloth blending harmoniously with the white and occasionally coloured garments of the men. Marriage used to be a very simple matter; chiefs brought marriageable girls to the king, and were themselves given women by their subordinate officials or bought them. The poorer people either bought wives for cattle or gained them in war, while occasionally a superior awarded his subordinate by giving him a woman. There seems to have been no particular ceremony in the matter, nor was there any limit to the number of wives a man might have. Even now, when the missionaries have undoubtedly made a great impression on these barbaric customs, such ideas have not disappeared; and I recollect a big chief bringing a case to me in which he thought he had a great grievance against the opposite faction. He had married a girl, and had agreed to pay so much for her, but as he was rather poor at the time half was to be paid down and the rest later. Before he had finished his payments she was killed by a leopard outside his house, and he promptly objected to pay the balance. The king very properly decided that he must pay, and the chief was quite unhappy when I pointed out that he had no cause for complaint.

DRUMS.

No reference to the customs of an African tribe is complete without some note of the musical instruments in general use, and more especially the ubiquitous and apparently sleepless drum. Give a Soudanese soldier an old tin jam pot or a biscuit tin and you will find an impromptu ball soon under way; and the Waganda are no exception to the rule, and though they have not the comparatively musical ear of the Soudanese, still they are fond of such music as they have. The ordinary native banjo

is in constant use, and, though we can hardly trace a tune, still two or three together are not unpleasing to my, perhaps, uneducated ear. There is also a rather pretty instrument made of a piece of wood fastened across two rolls of straw; two persons, one on each side, tap these pieces of wood, each of which has a different note, with small sticks, and the result is certainly pleasing. But no instrument can be compared with them to the almost sacred drum. So fond are they of it that, except for a few hours at night, it is always heard, and for years after a chief is dead his drum is regularly beaten every morning by persons specially appointed for the purpose. No big chief makes a journey without one or two men carrying small tubular drums, which are played with the fingers, and one or more lads playing on a sort of penny whistle a tune which never varies. But besides being used on every possible occasion as an instrument, it has another and more important use. Let the call for war be given by the king's drum, and the commotion is extraordinary; the women begin to lu-lu-lu, while every drummer who hears it beats his own chief's call, and passes on the call to arms.

Each chief within hearing collects such of his men as are on the spot, and dashes off to the king's hill, eager to show his loyalty and devotion to the kabaka. The signal spreads in an incredibly short time over the whole country, and within a very few days the whole strength of the nation can be collected. Immediately after the beating of the war-drum, if an expedition is determined on which requires the whole strength of the country, the king appoints a chief as commander, and he has the right and title of kabaka, and may no longer sleep in the same place as the king, but has to go a short march on taking leave. He has, during his absence, all power that the king himself would have. I have once seen the war-drum beaten by the king as a signal to the whole country, and a most interesting ceremony it was, but I am sorry to say I have more often seen it beaten by one faction to collect its forces to fight its countrymen. Sometimes it was premeditated, on other occasions the signal was given as a drunken freak, but always the result was the same, and for us in Kampalla it was always the signal for a time of worry and anxiety.

Uganda is not a great game country. In parts where there is no elephant grass there are antelopes and zebras, and in certain districts elephants are plentiful. They are keen hunters, and kill the elephants with guns and spears. They generally hunt in parties of eight or nine men armed with old tower muskets, out of which they fire a long iron bullet, and their great shot is the knee; once disabled there, the great brute is at their mercy and eventually succumbs. In the forest the natives often hunt them with the spear. A tree is selected over a path often used by elephants, and the spear, which is about 3ft. long and very strong, is placed in a heavy wooden socket, which is suspended above the path at a considerable height. When an elephant passes beneath, the spear and socket are dropped, and the weight drives the spear deep into the animal's back, which rushes away, and striking the haft of the spear against every bough enlarges the wound every moment, until finally he falls exhausted from loss of blood. Pitfalls are also used, but I fancy that it is very seldom that an elephant is stupid enough to be caught in one. Antelopes are hunted with spear and net. The latter are stretched in a suitable place, and the animals are driven to this and speared when entangled in the meshes. There is a sort of edible rat which is hunted with nets and dogs, but to my mind the best thing they do is to kill the leopards which infest the country and constantly kill people. Whenever it is suspected that a leopard has taken up his abode in a piece of jungle, the whole country-side turns out, every man carrying a big stick with a good knob at the end. I have seen a hunt at the capital got up by the Katikiro, in which, I daresay, 2,000 men took part; the jungle was surrounded, and shoulder to shoulder the ring closed in, the

tall elephant grass being beaten perfectly flat with the sticks as the circle got smaller. Finally, with a roar, the leopard tried to pass out, and charged the circle; but he hadn't a chance. His nimble adversaries fell back and surrounded him, and in a few seconds the life was beaten out of him. After much singing, shouting, and drum-beating, the body was carried in triumph to the king. As many as four have been killed in this way in one day.

In negro-land little value is set on a man's life. If a man is killed by accident, a cow or a cap-gun is the price paid in compensation by the person who has killed him. With this low value on life, it can hardly be expected that in ordinary cases the funeral ceremonies should be elaborate. In the olden days all persons killed by the king's executioners were thrown into the high grass on either side of the road, or left exposed at the place of execution for the birds to devour.

We may thank our stars that we live in Europe, and not under a savage and irresponsible king in Central Africa. The stories told of the cruelties of the kings of Uganda are terrible. I have been told that in Mtesa's time—that is, within the lives of many of us now present—the king has from superstitious terror sent his executioners to take their stand in one of the main roads, a mile or so from the capital, and to kill every person who came along, be they chief or peasant, woman or child, and that on one of these occasions the paramount chief of Chagwe, who in the olden days ruled over the whole of Usoga in addition to his province, was butchered like a sheep with all his personal attendants. Again, Mtesa's Katikiro is said to have, as a sacrifice to his heathen gods, cut a trench about 20ft. long and a couple of feet broad, and then had people's heads cut off until the blood reached to his knees; and I remember talking of these horrors with a very old chief whose business was to catch antelopes for the king's eating. He said it was quite true that these things were done in Mtesa's time, but that his immediate predecessor was still more inhuman.

However, all these horrors are past now. When we went there, we found two factions in possession of the country under a scheme which invited friction, and which no one but a negro could have devised. Imagine the proprietor of a large estate belonging to one religious faction with his agent of the opposing party, and his tenants alternately of either side; and give the tenant such power over his labourers that they must join his side, or lose their allotments. Scatter such properties over the country, taking care that no two of either faction are together. Let the king and his chief adviser belong officially to the opposing parties, and you will have a very good idea of the state of Uganda when Captain Lugard arrived, and if this were not enough, the Mahomedan faction driven to Unyoro made constant raids in every direction. Such a state of affairs was almost impossible, and a crisis took place. But, grave though it was, and scandalous as was the spectacle of a civil war between parties whose only standpoint was that they represented the two great branches of the Christian Church, still these events have brought good to the country; and now that some concessions have been made to the Catholic party, in almost the exact terms of a recommendation I had the honour to make to Sir G. Portal, I feel sure that this country with its people, by reason of its position, and the intelligence, bravery, and activity of its people, will in time become a valuable possession, and a centre for the spread of missionary enterprise, conducted on sounder lines than heretofore. Great results have been obtained, from a missionary point of view, by either Catholics or Protestants, but the greater work remains of raising the status of the people on a level with the Christian teaching. Let arrangements be made by which each mission extends and works in its own sphere, and let the men chosen as missionaries in this country be specially selected, and I can see nothing but what is right and promising in the future of that country.

LIST OF MAPS, BOOKS, JOURNALS, &c.,

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185. Manchester. Transactions of the Statistical Society. 1891-92.
186. Manchester. The Textile Mercury. 1882. Vol. VI., Nos. 141-193.
187. Manchester. The Textile Recorder. 1892. January to December, Nos. 105-116.
188. Manchester. Union of Lancashire and Cheshire Institutes.
189. Manchester. Journal of the Manchester Geographical Society. Vol. VII., 1-12
190. Newcastle-on-Tyne. Journal of the Tyneside Geographical Society. Vol. II., Nos. 1-2.
191. Newcastle-on-Tyne. Transactions of the North of England Institute of Mining and Mechanical Engineers. Vol. XXXIX., Parts 1-3 ; XL., 1-5 ; XLI., 1-5. Annual Report. 1891-2.
192. Penzance. Royal Geological Society of Cornwall.
193. Salford. 43rd Annual Report of the Museum, Libraries, and Parks Committee. 1890-91.
194. York. Yorkshire Philosophical Society. Annual Report for 1891.

ANALYSIS OF EXCHANGES.

Only the most important papers have been indicated. A very large number of smaller articles of great interest will be found on reference to the books themselves.

* * The black figures refer to the number of the Journal in the preceding list, and the lighter figures the pages where the information will be found.

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- Berne Geographical Congress, 1891, Proceedings (discussions on various questions, &c.). (7. 1.)
- Progress of Geography in 1891. By Sir M. E. Grant-Duff. (176. 353.) By D. M. Ferreirs. (53. 14.) By A. D. de St. André. (98. 94.)
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- Principles of Geography. By H. R. Mill, D.Sc. (159. 87.)
- Geographical Considerations on the Centres of Civilisation, with map. (14. 504.)
- Services of Geography in Economic Questions. (7. 656.)
- Natural Classification of Geographical Phenomena. (7. 355.)
- The History of Commerce. By Rev. L. C. Casartelli. (180. 7.)
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- Trade of France with Cape Colony. (8. 114.)
- Universal Postal Convention agreed to at Vienna, 1891. (13. 202, 247.)
- Chartered Colonial Companies. (10. 170.) (39. 272.)
- Coaling Stations and Trade Routes, with maps. By Lieut. Knight, U.S.N. (67. 91.)
- Statistics of Professional Syndicates and Trade Unions. By V. Turquan. (86. 221.)
- Designing and Manufacturing, illustrated. By R. Beaumont. (187. 196.)
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- American Cotton on Foreign Soil, with illustrations. (187. 206.)
- Artificial Silk, illustrated. (186a. 244.)
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- Tea Culture. By M. Jacobsen. (51. 431.)
- Coffee Plant. By S. Vail. (67. 141.)

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- Sources of Coffee. (54. 257.)
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- Two MSS. Maps of Glareanus in the Munich Library. Illustrated. By E. Oberhammer. (60. 67.)
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- The Construction of a Map. By G. Dallet. (70. 11.)
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- The Proposed Map of the World, on the scale of 1: 1,000,000. (7. 191, 199.) (11. 165.) (89. 433.)
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- Topography. By L. Drapeyron. (76. 87.)
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- Evolution of the Earth's Crust. By C. Callaway, D.Sc. (155. 241.)
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- On the question of the Internal Gaseous Condition of the Earth. By S. Günther. (60. 1.)
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- Progress of Cartography in Various States of Europe. By Col. A. Botto. (85. 681.)
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- Memoir of H. W. Bates, F.R.S., with portrait. (176. 245.)
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EXPLORATION IN CENTRAL SOUTH AUSTRALIA.

AN interesting report has only recently been presented to the Surveyor-General of South Australia by Mr. J. Carruthers, of the Survey Department, on the country triangulated in the Everard, Musgrave, Mann, and Tomkinson Ranges, and Deering Hills, during the years 1888, 1889, and 1890. The country surveyed lies between Lake Eyre in the south-east and Lake Amadeus on the north-west. The report gives a useful description of the character of the ranges and of the country generally: "The Musgrave Ranges are composed principally of red granite rocks, are covered with spinifex and a few scattered pines; the flats between the hills, which are principally formed by large creeks coming out of the ranges, are beautifully grassed; wild geranium, vetch, and patches of salt and cotton bush grow luxuriantly, the soils being a rich red sandy alluvial and firm red loam. Mount Woodroffe, the highest point in these ranges, is between 4,400 and 4,500 feet above the sea-level; from its top a magnificent view can be obtained in all directions. Ayers Rock, about 90 miles to the north-west, can be dimly seen, and Mount Connor, a most conspicuous feature to the north, rising abruptly above a sea of mulga scrub, the country between being level and apparently sandy. This mount (Connor) is a large table-topped hill covered with dense mulga, and is noticeable from the fact of there being no other hill near it. Mount Morris, near the western extremity of the range, is the next highest point, being between 4,100 and 4,200 feet above sea-level; the hills here are more broken, and consequently there is a greater area of good grassed country than at the eastern end of the ranges. The Everard Ranges are chiefly composed of red granite, and covered with spinifex, a few pines, stunted gums, and bloodwoods; the country between the Everard and Musgrave ranges is principally sandy, with patches of dense mulga, spinifex flats, salt and cotton bush flats, geranium, and wild vetch; there are also a few sandhills, but to no extent. The Mann Ranges commence about 35 miles west of the Musgrave Ranges. The good country here is confined to flats between the hills. The space between the two ranges is mostly covered with a forest of large casuarina trees and occasional patches of thick mulga scrub, carragong, mallee scrub, and sandy spinifex country, and with the exception of only a few native wells is waterless. As the western end of the Mann Ranges is approached, the country becomes more sandy, with scattered broken hills, and considerable stretches of poor spinifex country, the timber being mallee, quondong, casuarina, with low sage bush. The Mann Ranges are covered with pines, bloodwood, a few scattered gums, dense spinifex, and scattered patches of coarse grass, the formation being red and grey granite. The Deering Hills south of the Mann Ranges are also composed of red and grey granite, with a few pines and bloodwoods. The hills are much broken, with well grassed extensive flats between them. The country between the Deering Hills and Mann Ranges is principally of a poor sandy nature covered with dense spinifex, casuarina, mulga, and mallee, but there are small patches well grassed. With the exception of a few rock-holes the country south of the Mann Ranges is waterless. The Tomkinson Ranges, about 25 miles west by north of the Deering Hills, are composed of grey and red granite, with large outcrops or dykes of basalt. These hills are covered with spinifex, scattered pines, small bloodwoods, and patches of coarse grass, and run in parallel lines, confining extensive flats of Mitchell grass, cotton and salt bush, wild vetch, geranium, and other herbs and grasses, the timber being bloodwood, cork trees, patches of mulga, scattered pines, and low bushes, the soil a rich brown and red sandy loam. The country between the Mann and Tomkinson, and north, south, and west of the latter, is very poor, chiefly sandhills covered with spinifex and sage bushes, also a little quondong, mulga, and mallee, with gravelly ironstone on surface of flats between sand-ridges."—*Proceedings of the Royal Geographical Society.*

THE
MANCHESTER GEOGRAPHICAL SOCIETY.

RULES.

I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be :—

1. To further in every way the pursuit of the science, as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with Consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less-known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected member notice of his election, a copy of the Rules of the Society, and a card announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. Any ordinary member shall pay an annual subscription of £1 1s., or he may compound by one payment of £10 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members; and no member, whose subscription is two years in arrear, shall receive the Journal.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

ORDINARY MEETINGS.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of proceedings shall be as follows :—

- (a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.
- (b) Presents, whether of money, books, maps, charts, instruments or specimens made to the Society to be announced.
- (c) The election of new members to be declared and the names of candidates to be read.
- (d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

ANNUAL MEETINGS.

30. The Annual Meeting of the members shall be held at such time and place as the Council shall determine.

31. Fourteen days' notice of such meeting shall be sent to every member within the United Kingdom, who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

SPECIAL GENERAL MEETINGS.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI.—COUNCIL AND OFFICERS.

THE COUNCIL.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

PRESIDENT AND VICE-PRESIDENTS.

43. The President is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

CHAIRMAN OF THE COUNCIL.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

TREASURER.

45. The Treasurer has the charge of all accounts ; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

SECRETARIES.

49. The duty of the Honorary Secretaries shall be :—

- (a) To conduct the correspondence of the Society and of the Council.
- (b) To attend the meetings of the members and of the Council, and minute their proceedings.
- (c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting ; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.
- (d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

LIST OF MEMBERS,

December 31st, 1892.

Note.—H signifies Honorary, C—Corresponding, L—Life, A—Associate, * Affiliated Societies. All others are Ordinary Members.

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|--|--|
| hAberdare, The Right Hon. Lord, G.C.B. | Behrens, Charles. |
| Adam, Sir Frank Forbes, C.I.E. | Behrens, Gustav, J.P. |
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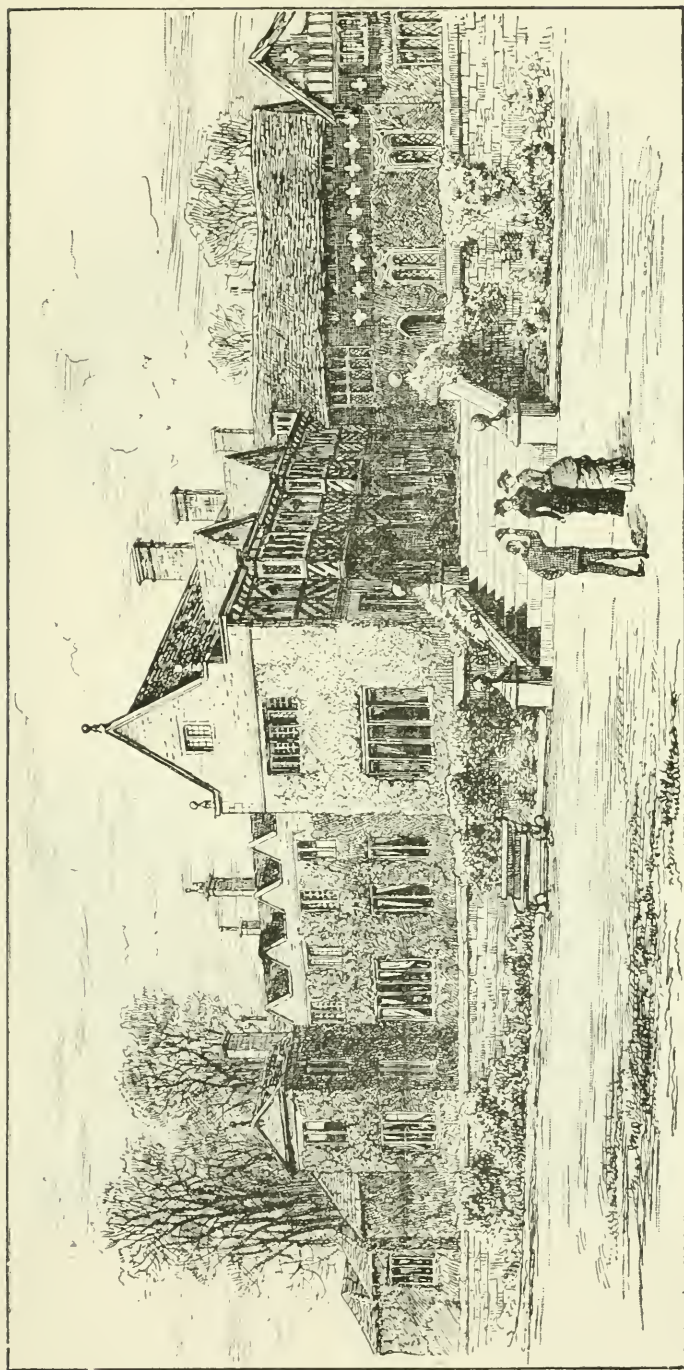
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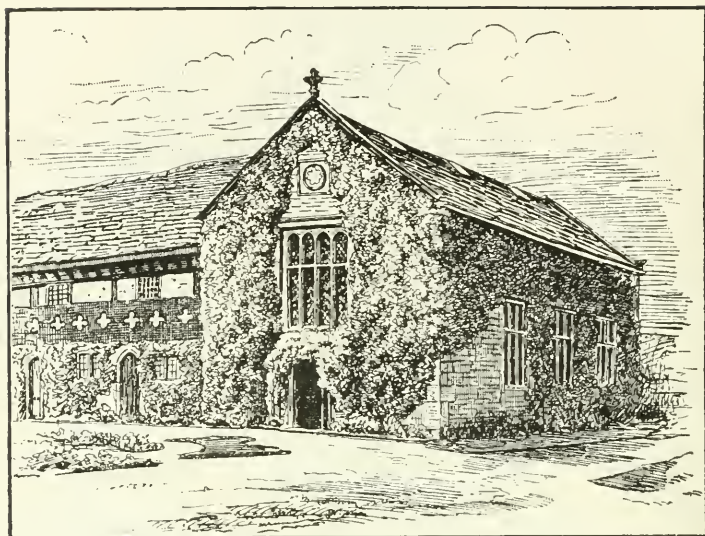
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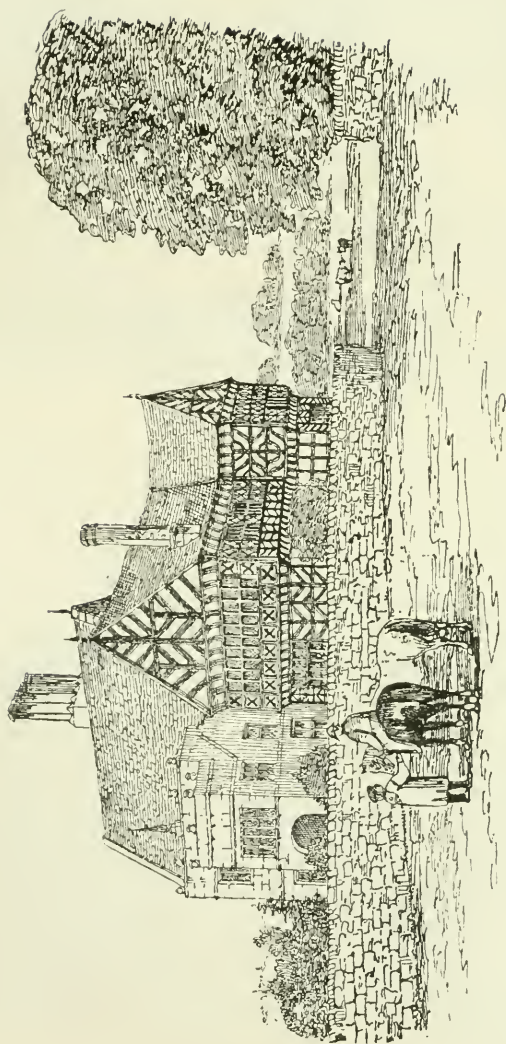
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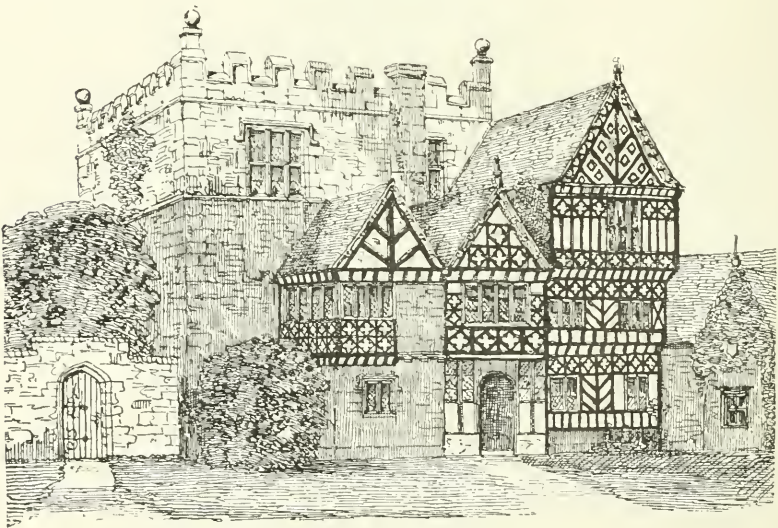
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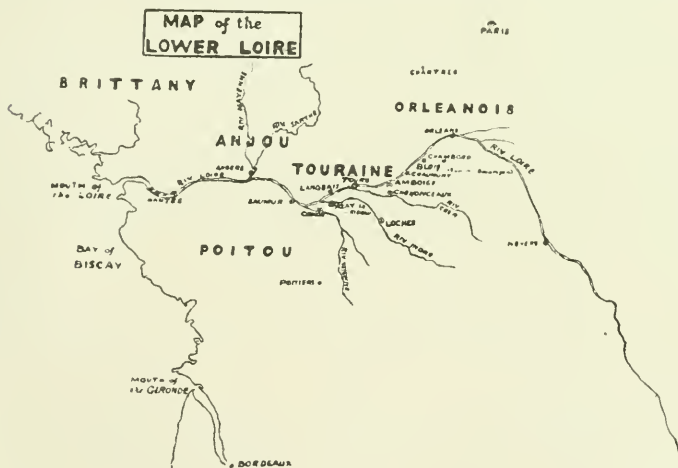
MANCHESTER GEOGRAPHICAL SOCIETY.

THE LOWER LOIRE.

By MR. E. W. MELLOR, J.P., F.R.G.S., F.I.Inst.

[Addressed to the Members, in the Memorial Hall, Wednesday, February 1st, 1893,
at 7-30 p.m.]

IN Mount Gerbier des Jones, in the range of the Vivarais, part of the chain of the Cevennes, in the south-easterly corner of France, the River Loire takes its rise. For upwards of 200



miles this river flows in a northerly direction, continually expanding and increasing in importance until it reaches the heart or centre of France. This first portion of the river we may term the Upper Loire. Arrived in the centre of France the river turns to the left a few miles east of Orleans, and thence flows more or less due west to the sea. This second portion of the river, flowing from east to west, we may term the Lower Loire, and its valley forms the ground of our ramble this evening.

VOL. IX.—Nos. 1-6—JAN. TO JUNE, 1893.

I will ask that the lights may now be turned down, in order that we may project upon the screen a map which I have sketched, showing the course of the Loire from Orleans to the sea, and the places to which I would ask you to accompany me in my photographs.

The provinces bordering on this great river—Orléanois, Touraine, Anjou and Poitou—have been called the “Garden of France,” from the luxuriance of its crops, vineyards, and orchards, and all with comparatively little laborious effort; “*c’est le pays de rire et de ne rien faire.*” It is a fascinating valley, this Loire Valley—full of history, full of romance! Here Plantagenets lived and died; here the Black Prince fought. Probably no stream, for the same length of its course, has so much history to tell as the Lower Loire. Until the end of the 16th century its banks were covered with old feudal towers and castles, within whose walls, from time to time, have dwelt the kings and queens, and all the famous men and women of those ages in France.

Starting from Orleans, ever associated in our minds with the famous maid, Joan of Arc, and following the river, we visit Chambord, a typical castle of Francis I.; Beauregard; Blois, with its bright memories of Louis XII., “father of his people,” and gloomy memories of the Medicean influence, and the murder of Guise; Chaumont, where we again hear of Catherine de Medicis; Amboise, the favourite residence of Charles VIII., and where Marie Stuart received her “baptism of blood;” Chenonceaux, the chateau of Diana de Poitiers, the favourite of Henri deux; Tours, the capital city of Touraine, whence we make an excursion to Loches, the cradle of the Plantagenets; Azay-le-Rideau, a bijou chateau; Langeais, the wedding place of Charles VIII. and the strong-minded Anne of Brittany; Chinon, the oldest castle we visit, with its memories of Joan of Arc; Saumur; Angers, the capital of the ancient province of Anjou; and our ramble ends at Nantes, where Henry of Navarre signed his famous edict giving protection to the Protestants. All these places are national monuments—landmarks of French history.

You will observe that in following down the stream of the Loire we visit these places in geographical order, not in chronological order. I shall have to make such frequent reference to the French kings and queens of the Middle Ages, that I think it will add greatly to your interest if I introduce you to the “*Dramatis Personæ*,” with whom I wish you in your minds to people the deserted chambers and ruined towers we are about to visit. I have therefore prepared a chronological table of the French kings during the 220 years of 1422 to 1643, to which I have added the names of their queens, and the contemporary sovereigns of England.

TABLE OF KINGS OF FRANCE FROM 1422 TO 1794.

House.	Kings.	Years.	Married.	Contemporary English Sovereign.
Second House of Valois.	CHARLES VII. (The Victorious)	1422-1461	Mary of Anjou.	Henry VI.
	LOUIS XI.	1461-1483	Margaret Stuart of Scotland. Charlotte of Savoy. Anne of Brittany.	Edward IV.
	CHARLES VIII. (The Affable)	1483-1498		Edward V.
	LOUIS XII. (The father of his people.)	1498-1515	Jean, daughter of Louis XI. Anne of Brittany.	Richard III.
			Mary, daughter of Henry VII. of England	Henry VIII.
	FRANCIS I. (The Father of Letters)	1515-1547	Claude of France, daughter of Louis XII. Eleanor of Austria. Catherine de Medicis.	Henry VIII.
	HENRY II.	1547-1559		Edward VI.
	FRANCIS II.	1559-1560	Marie Stuart (Queen of Scots).	Mary.
	CHARLES IX.	1560-1574		Elizabeth.
	HENRY III.	1574-1589	Louise of Lorraine. Marguerite de Valois.	Elizabeth.
Bourbon.	HENRY IV. (The Great, King of Navarre)	1589-1610	Marie de Medicis. Anne of Austria	James I.
	LOUIS XIII. (The Just)	1610-1643		James I.
	LOUIS XIV. (The Great, also Dieu-donné)	1643-1715	Maria Theresa, of Austria, Infanta of Spain (1660). Madame de Maintenon (1685). Maria Lecinski (1725).	Charles I. (1625). The Commonwealth (1649). Charles II. (1660). James II. (1685). William and Mary (1689). Anne (1702). George I. (1714). George II. 1727). George III. (1760).
	LOUIS XV. (The Wellbeloved)	1715-1774		
	LOUIS XVI.	1774-1794	Marie Antoinette, of Austria.	
		1794-The Revolution		

In 1422, seven years after the battle of Agincourt, Charles VII. succeeded to the throne. It was during his reign that Joan of Arc accomplished the deliverance of Orleans and a large part of France from the English.

Of the next king, Louis XI., a crafty and unscrupulous monarch, Sir Walter Scott has given us a graphic, and not much exaggerated account in "*Quentin Durward*." His first wife, Margaret of Scotland, a charming, accomplished, and learned princess, died before he came to the throne. His second wife, Queen Charlotte, was the mother of his children.

Louis XI. was succeeded by his son, Charles VIII., who married Anne, heiress to the Duchy of Brittany, thus uniting that province with the crown of France. Charles's death was the result of a blow on the head, received in passing through a low doorway.

Louis XII. was the cousin of Charles VIII. Being the next heir to the throne, Louis XI. had forced him to marry, against his will, his daughter Joan, thus keeping the succession in his family. As soon as he came to the throne Louis XII. and Joan were divorced, and Louis married his cousin's widow, Anne of Brittany. He thus kept possession of Brittany, and she had the, I believe, unique experience of being *twice* crowned Queen of France. We shall hear much of Louis and Anne in our ramble, especially at Blois. Louis XII.'s third wife was Mary Tudor, sister of Henry VIII. of England; she brought in her train to France, as a maid of honour, a young girl, one day to be Queen of England—Anne Boleyn.

Francis I., Count of Angoulême, was Louis XII.'s cousin's son. He was married as a boy to the Princess Claude, daughter of Louis XII. and Anne of Brittany. The reign of Francis is known as the age of the Renaissance. For his second wife Francis I. married Eleanor, sister of the Emperor Charles, to cement a peace between the two monarchs.

Henry II. was the son of Francis I. He married the niece of Pope Clement VII., Catherine de Medicis, whose sinister influence caused so much suffering to France during the next three reigns, for Francis II., Charles IX., and Henry III. were the sons of Henry II. and Catherine. We shall hear much of these three kings and their queen-mother, particularly at Blois.

The first son, Francis II., was married to Marie Stuart, Queen of Scots. He was a sickly youth and soon died, but in his short reign there occurred the first massacre of the Huguenots at Amboise.

The second son, Charles IX., never married. His reign is stained with the massacre of the St. Bartholomew, in which some three or four thousand Huguenots were killed in Paris. The massacre was brought about by the plots of the Guises, and

the queen-mother, Catherine de Medicis. It made a madman of Charles IX.

The third son, Henry III., was a poor weak creature, entirely under the influence of the queen-mother and the Duke of Guise, whose power became so oppressive that Henry III. sought relief, as we shall see, at Blois, by the cowardly expedient of assassination. He was the last king of the House of Valois.

You see how the memory of cruelty and bloodshed clings to the name of Catherine de Medicis during the thirty years when her voice was a power in France.

Henry IV. of Navarre, the first king of the House of Bourbon, was a very different man from the last Henry. He was a firm, sagacious king, anxious to do the best he could for his people and his country. He was a Huguenot, and to reconcile his party with the Catholic party he married Margaret of Valois, a sister of the last three kings. The Catholics, however, were not satisfied until Henry IV. himself turned Catholic, but in doing so he gave the Protestants protection in his famous Edict of Nantes. Henry's second wife was Marie de Medicis; she brought him more wealth than happiness, and was familiarly spoken of as the "fat bankeress from Florence." She was the mother of the next king, Louis XIII.

You know that the Salic law permits only men to rule in France. The reigning monarch was always a king, never a queen. There is a saying that the women have amply revenged themselves on France for this law. Now, taking only the 200 years of this table, notice the power of the feminine influence.

Charles VII. was under the influence of the gentle Agnes Sorel, and his country was delivered by Joan of Arc.

In Louis XII.'s time France was plunged almost into civil war by the enmity of the queen, Anne of Brittany, and Louise of Savoy, mother of Francis I.

Henry II. was more under the influence of the beautiful widow, Diana of Poitiers, than of anyone else, and during his life the queen, Catherine de Medicis, remained in the background. After his death Catherine amply made up for it, by turning Diana out of her chateau, as we shall see, at Chenonceaux, and by the miseries she brought on France.

We commence our ramble at Orleans, a city next in importance to Paris in French history. Indeed, in one point of dignity Orleans has surpassed Paris, for Orleans has twice beheld the crowning of a native king of the French, which Paris has never done. We have here a photograph of the west front of the Cathedral at Orleans. It is remarkable as the only Gothic Cathedral built in Europe since the Middle Ages. The style of the exterior is tolerably pure flamboyant, although rebuilt in the 17th century, at a time when Gothic architecture was on the decline. As you see, the west front consists of three

somewhat plain pointed portals, surmounted by three rose-windows.

Henry IV., he of Navarre, the Protestant king, you remember, furnished the funds for rebuilding this cathedral, in the hope of ingratiating himself with the Catholics, and to free himself from the Pope's excommunication. Hard by the Cathedral is the Mairie, or Town Hall, of which we now have a view.

Orleans is a city of upwards of 52,000 inhabitants, and, owing chiefly to the progress of modern improvements, nearly all its historical relics have disappeared. This Town Hall is of greater age than it seems. It was in one of the rooms of this building that Francis II., the husband of Mary Queen of Scots, died.

Here, in this city, our minds naturally turn to the famous Maid of Orleans, Joan of Arc. Here, in front of the Mairie, is a statue of the Maid, of which we will now get a nearer view. This statue is said to be by far the worthiest representation of Joan in Orleans. It is the work of the Princess Marie d'Orleans, and was presented by Louis Philippe.

You remember that the English army had victoriously marched into the heart of France and had laid siege to Orleans. The siege had lasted six months, and every day the city was more hardly pressed and more strictly blockaded by the English commander, the Duke of Bedford—once, even, the besieged made overtures to capitulate; they little knew of the succour at hand.

Joan, commissioned by Henry VII., set out with a heavy convoy of victuals, and a body of ten or twelve thousand men, for the relief of Orleans. She arrived before the city on the 29th of April, 1429, and at eight o'clock the same evening she entered the city on horseback at the head of her troops. The people were overjoyed, and attributed divine inspiration to Joan, thenceforth known as the Maid of Orleans. We shall hear of Joan again at Chinon, in the days prior to her martial successes.

We now arrive at Chambord, one of the typical castles of Francis I. At this period, the first half of the 16th century, called, as you remember, the age of Renaissance, men began to adopt more civilised manners, and with more chivalrous feelings became less prompt in emphasising their arguments with spear and sword. This change of feeling was shown in their buildings, and in Francis' castle at Chambord we have a good example of the transition from the old feudal castle to the more modern chateau.

The old feudal castles were, in plan, generally a system of massive central towers, supported by flanking towers, pierced with narrow slits for the archers, connected by strong walls, and surmounted by a machicolated parapet, from which boiling oil could be poured upon the heads of besiegers mounting scaling ladders; the exterior, therefore, presented a very warlike

appearance. But you observe that Chambord has an eminently peaceful look—yet the old plan is preserved. Here are the central and flanking towers, but the narrow slits are enlarged to large and lofty windows, and the machicolations modified to mere ornament.

The great feature of the interior of Chambord is the famous double spiral staircase, of which we now see a portion in this photograph. It consists of a double course of steps so contrived that persons may pass up or down without meeting or seeing each other. This staircase is described by James “as a majestic piece of humour.” The principle is simply that of a two-threaded screw. You may see a good illustration of this in the Humphrey Chetham Library in Manchester, where there are some old altar rails, consisting of a double spiral carved out of the solid wood, convoluting round each other without once touching.

We shall hear again of Francis I., the builder of this castle at Blois; let me therefore remind you, as we ascend by his staircase to the roof, that Francis I. was the king who arranged a meeting with the English Henry VIII. on a scale of such extravagant splendour that it is known as the “Field of Cloth of Gold.” For many years of his reign Francis engaged in a struggle with the Emperor Charles V. of Germany. Peace was finally negotiated by two women—Louise of Savoy, mother of Francis, and Margaret of Austria, aunt of Emperor Charles. From this it is known as “the ladies’ peace.” Another instance, you see, of the important part played by ladies in French history.

The roof of this enormous chateau of Chambord consists of a multitude of chimneys, galleries, and gables, and the whole of it is ornamented as you see this small portion—rich niches, and ornamental chimneys decorated with lozenges, crescents, circles, and so forth, of black slate let into the masonry. Chambord has 365 of these chimneys, 440 rooms, and 30 staircases.

A drive of about two hours from Chambord brings us to a small chateau—Beauregard, which formerly belonged to Francis I., but is now the property of the Vicomtesse de Cholet, and a charming country house she has here. Notice all round the chateau medallion heads of all the kings of France. The chief interest in the chateau centres in the long gallery facing us. It is filled with about 350 portraits of celebrated personages, not only of France but of all Europe, from about 1400 to 1650, and comprises a complete series of fifteen reigns down to Louis XIV., and, as you will believe, they form a deeply-interesting study.

Following the stream of the Loire, we next come to Blois, where is one of the most beautiful and elaborate of all the old royal residences in this part of France. Entering the town from the station, the first view of the chateau that meets our gaze is the wing or façade of Francis I. This façade consists

only of deeply-recessed balcony windows, suggesting more the idea of boxes at a theatre than the windows of a palace of dark memories. The lower windows were the rooms of Catherine de Medicis, queen of Henry II., Francis' son. Here was her chapel or oratory. Above were the apartments of Francis II. and his queen, Marie Stuart of Scotland. These three windows are those of Henry III.'s bedchamber, in which the Duke of Guise was murdered.

Francis I's queen was Claude, daughter of Louis XII. and Anne of Brittany, and it was her fondness for Blois, her father's home, that persuaded Francis to commence the building of this wing. The entrance to this chateau of Blois is in the façade of Louis XII. In a deep niche over the gate is a statue of Louis XII. himself, under a beautiful canopy. This statue is a reproduction of the original one which was destroyed at the revolution. Underneath is his badge of a porcupine, surmounted by a crown, which he adopted from the badge worn by his father, the Duke of Orleans, at the battle of Agincourt.

This Louis XII. remitted some of the excessive taxation of his people, and allowed them to develop the internal resources of the country; he was therefore called "the father of his people." As we have already seen, after divorcing his first wife, Louis XII. married Anne of Brittany, the widow of his cousin and predecessor, Charles VIII. Anne was only 23 years of age. On both sides it was a marriage of policy, without any lively affection, but with mutual esteem and regard. In this photograph we have entered the courtyard of the chateau through the gateway seen on the right.

You notice the porcupine badge of Louis XII. over the doorway before us; it is a staircase leading to the rooms carried by this colonnade, where are the rooms occupied by the Duke of Guise on the fatal occasion of his attending the meeting of the States General held here. This arcade is part of the wing of Louis XII.; the lightly-chiselled columns are his work, and, as you see, they are ornamented with the fleur-de-lys. The chamber of Anne of Brittany, his queen, is entered from this arcade, and we will visit it as we leave the chateau. Let us first stand in this arcade and look across the court yard at the interior wing of Francis I., of which we saw the exterior just now.

The gem of Francis' wing, indeed of the whole chateau, is this open spiral staircase. Try to imagine ourselves standing here three to four hundred years ago and see passing up and down this staircase Francis I. and his queen, Claude, who loved this place so well; the queen-mother Catherine de Medicis, brooding over her plots; Francis II. and the lovely Mary Queen of Scots, happy in their brief spell of married life; the timorous Henry III. scheming to free himself from the power of the Guises.

The American writer, James, referring to this spiral staircase, says: "This exquisite, this elegant, this transcendant piece of architecture is the most joyous utterance of the French Renaissance. It is covered with an embroidery of sculpture in which every detail is worthy of the hand of a goldsmith."

Let us examine some of these details more closely. The staircase is of cylindrical form, with wide openings, so that the stairs are open to the air. Notice the carving on the pillars and the beauty of these figures. Although they have been exposed to the atmosphere for some 300 years, they still preserve the clear touch of the sculptor's chisel. Who the sculptor was is unknown, but it is believed to be Goujon, who flourished in the middle of the 16th century. There are several peculiarities of his style, noticeable more particularly in the figure on the right.

There is at Anet a statue, "Diana the Huntress," by Goujon, for which Diana of Poitiers, of whom we shall hear presently, was the model. In that statue, and in this, there are details identically alike—the same headdress and pendant, the same bracelet similarly chiselled on the upper part of the arm, and, what is more, a similar peculiarity of anatomical detail.

The interior of the staircase possesses a remarkable and ingenious feature. Theodore Andrea Cook writes: "The spiral upon the central column is the exact curve contained within a sea-shell—the *Voluta Vespertilio*—and it seems more than probable that an actual shell was used consciously as a model, for the absolutely unique double curve of the steps, with the relation to the ascending curves from which they grow, is precisely the same as the spiral and its attachments in the shell."

Having ascended the stairs, we enter the apartments of Catherine de Medicis, and in this photograph we are in her "cabinet de travail," *i.e.* study or library, or boudoir. This room, you notice, is panelled from floor to ceiling, each panel—there are 230 of them—being of different design. The designs are richly gilt on woodwork of a dark chocolate colour. The panels all conceal secret closets or cupboards.

In appearance, Catherine de Medicis was stout, grave, sombre, almost livid in the daytime, though it is said her ivory skin lighted up well at night. Her life was a round of intrigues, plots, and cruelties. Those who would not bend to her will she knew how to break, or to remove altogether. It was entirely owing to her evil suggestions that the mind of her unhappy son, Charles IX., was worked up to the pitch of frenzy necessary to order the massacre of St. Bartholomew, and she indirectly countenanced that dark deed.

Passing to the apartments of Henry III. we enter the bed-chamber of that king. The alcove on the left contained an

altar, and was used by Henry III. as an oratory or chapel. This old chair has a large F, the initial of Francis I.

The all-powerful Duke of Guise, leader of the numerous Catholic party, was suspected of designs upon the crown. He used every opportunity of procuring the king's abasement and his own advancement. The timid and miserable Henry III. lived in fear of Guise, and planned a deep revenge. About eight o'clock on that dark December morning in 1588 Henry sent for Guise. Some of the more trusted members of the "quarante-cinq," the king's body-guard, were waiting in the king's dressing-room, seen through this open door. As Guise entered they rushed upon him and stabbed him with daggers and rapiers. The duke, struggling with his murderers, entered through this doorway, and fell dead here at the foot of the king's bed, which stood just on the spot where I pitched my camera.

Catherine de Medicis died a few days afterwards in delirium, and within a year Henry III. was assassinated; so ended the 16th century red with the blood of its chief actors.

We now descend to the Salle des Etats on the ground floor, a hall in which the States General, a kind of parliament, met. We enter the hall from the royal apartments by this flight of steps in the far corner. The hall dates from the 13th century, and is, as you see, divided down the centre by a row of pointed arches. The king's throne was placed in the centre, under the arches; at this end were the clergy; in the middle the *Tierce-Etat*, or *Bourgeoisie*; at the further end were the *Noblesse*.

Imagine the assembly here at the meeting of the States immediately preceding the murder of Guise—a crowded hall—each party in its proper place. On a raised *daïs* sat the king, his queen on one side, and the queen-mother on the other. The Duke of Guise, in his white satin doublet, arrogantly proud and confident in the overwhelming strength of his the Catholic party, urging his unreasonable and extravagant demands upon the king. How it ended we have seen upstairs.

We now visit the chamber of Anne of Brittany. Anne had numerous suitors, and of the duke, her father, it was said that his policy consisted in making for himself five or six sons-in-law by means of one daughter. The little Breton duchess was proud and rather headstrong. She said, "I will marry none but a king or a king's son." As we have seen, she married Charles VIII., thus incorporating Brittany with France. She was business-like, and stipulated that if left a widow she was to have her duchy back again. As we have also seen, on the death of Charles she married his successor, Louis XII., and was therefore *twice* crowned Queen of France. Anne was short, pretty, a little lame, witty, able, imperious, and sharp-tempered. She kept up her court with dignity, and was respected by her

ladies. Louis XII. was a wise man: in reference to Anne's temper, said he, "One may put up with something from a woman when she loves her honour and her husband."

Over this fireplace you see the porcupine of Louis and the ermine of Anne, and above their initials L and A. Here again her initial and the twisted cord, a sign she often used.

Bidding farewell to Blois our journey down the Loire brings us to the chateau of Chaumont, where Henry Plantagenet met Thomas à Beckett for the last time before that prelate's murder. Like Chambord, Chaumont shows clearly the transition from the fortress to the later chateau. Here are the two flanking towers supporting the two central towers, which guard the entrance, and through these slots formerly projected the long levers for working the drawbridge.

In 1559, Catherine de Medicis purchased this chateau to exchange for Chenonceaux, which she coveted, and which her husband, Henry II., had given to Diana of Poitiers. Here on the right was the chamber of Catherine, and behind that was the room of her astrologer, for she was very superstitious and believed that the book of fate was written in the stars.

Chaumont was built by Charles d'Amboise, brother of the famous cardinal. In the stonework, on the left hand of the entrance gate, is carved the cardinal's hat and arms. The old red hat of the cardinal still hangs in the little chapel of this chateau. You may remember that the Cardinal Georges d'Amboise was the trusted minister of Louis XII. Those of you who have seen my Normandy photographs may remember the magnificent tomb of the Cardinal d'Amboise in Rouen Cathedral. The towers of Chaumont rise upon a wooded hill overlooking the river, and the little village lying below dwarfs into insignificance under their shadow. Here you see one of the vine-covered cottages of Chaumont-sur-Loire. It stands immediately opposite the entrance-gate of the chateau park. You notice the white cap and wooden sabots of the women—the work-a-day dress of the country.

We now pass on to Amboise. The castle of Amboise stands on a high table of rock above the town, and is described as "another Acropolis above a smaller Athens."

To distract their grief on the loss of their infant son, Charles VIII. and Anne of Brittany built two great towers, one here and the other at the corresponding corner at the back. The towers are 90ft. high and 42ft. in diameter, and spring from the base of the rock. They do not contain staircases but inclined spiral planes. We read of Francis I. and his guest, Charles V. of Germany, riding on horseback up these towers amid a blaze of torchlight. In recent years, 1842, the Duke of Orleans drove a coach and four up one of the towers on the occasion of his wedding.

In this castle was decided the doom of those 1,200 Huguenot prisoners concerned in the famous conspiracy of Amboise, which had for its object the termination of the power of their enemies, the Guises, over the young King Francis II. The plot was betrayed and the Guises took summary vengeance.

From this balcony Catherine de Medicis, her three sons, (Francis II., with his wife Marie Stuart, and the two subsequent Kings, Charles IX., and Henry III.,) together with their suite, all in court dress, witnessed the execution of those Huguenot prisoners. The streets of the town streamed with blood until the wearied headsman resigned his axe to other hands. The castle walls were hung with bodies of the victims and the remainder were thrown into the Loire. Yet the Guises, and Catherine were not satisfied, and the butchery at Amboise was only a prelude to the still more wholesale massacre of the St. Bartholomew.

In the terraced garden of Amboise Castle is the exquisite little Chapel of St. Hubert, which you see in this photograph. Architecturally the chapel is the gem of the chateau. In the larger carving we have the Virgin and the child, and kneeling on either side, the King and Queen of France—Anne of Brittany and Charles VIII.—one authority says it is her second husband, Louis XII., but that is, I believe, a mistake. The lower carving represents the legend of St. Hubert, the patron saint of the Chapel. Hubert was passionately fond of hunting, and neglected divine worship for this amusement. One day while hunting, a stag appeared before him having a crucifix bound between its horns, and he heard a voice threatening him with eternal punishment unless he repented. Hubert retired from the world, entered the priesthood, and was zealous in destroying remnants of idolatry. Hubert became the patron saint of hunting, and his descendants were supposed to possess the power of curing persons bitten by mad dogs.

To Francis I. is given, you remember, the glory of the French Renaissance—certainly he encouraged men of literature and science, and brought over from Italy such artists as Francesco Primaticcio, and Giovanni Battista Rosso, the pupil of Michael Angelo, and for the last two years of his life Leonardo da Vinci, whose remains are laid in the beautiful chapel which we have just left. This bust of the old master stands as you see under the shadow of the lime trees in the terraced garden of the chateau. Leonardo da Vinci lived here from 1517 to 1519. His wonderful painting of "The Last Supper" is familiar to us all in abundance of prints and photographs. In passing let me say that the boyhood of Francis I. was spent here at Amboise, under the guardianship of his mother, Louise of Savoy.

We now go on to Chenonceaux, sometimes considered the most lovely of all the Touraine Chateaux. It was built in the

more joyous days of Francis I., and is without the tragical memories of Amboise and Blois. The building of this chateau commenced in 1515, partly on the piles of an old water mill, standing in the bed of the stream. After the death of Francis I., the new king, Henry II., gave this domain of Chenonceaux to his favourite Diane de Poitiers, Duchesse de Valentinois. The queen, Catherine de Medicis, as we have already seen, coveted this chateau: and on the death of Henry she dispossessed Diana, giving her Chaumont in exchange. The fine detached tower on the right is the oldest part of the building. Diana of Poitiers extended the bridge, previously only partly built, across the river, which here is the Cher, a tributary of the Loire. This photograph is taken from the terrace of Diana's Italian garden. Diana of Poitiers is still preserved to France in the beautiful statue of Goujon, at Anet, "*Diane Chassereuse*," to which I have already referred. Catherine de Medicis entertained here Francis II., and Marie Stuart, and their court, with a round of fêtes, gaieties, and dissipations, to distract their minds immediately after the sanguinary deeds at Amboise.

Our journey now carries us to Tours, the capital city of Touraine, which ancient province was a marriage "apanage" of Mary, Queen of Scots, and her short lived husband, Francis II. As we leave the station and enter the principal street, there stands before us the Palais de Justice, the most important modern building in the town. It is in the Doric style of architecture, and was erected in 1840. This Palais de Justice in 1870, the time of the German occupation of Paris, and of the Commune, became the seat of Gambetta's Government, after he had escaped in a balloon from Paris. In April of the same year, Prince Pierre Buonaparte was tried here for the murder of Victor Noir, and was acquitted. From the Palais de Justice, the main street runs down to the river, and at the end of the street, facing the Loire, are the two buildings which you see in the photograph. They are—on the left, the Museum, containing a fine collection of pictures; on the right the Hotel de Ville, or Town Hall. A large piece of stonework is still missing from the entablature, knocked away by the Germans in a cannonade of the city, from across the Loire, during the Franco-German war of 1870. Tours has a steam tram to the neighbouring suburb of Vouvray—here you see the 1st and 2nd class car in front of the 3rd class car. The cars are waiting for the engine to back down and take them on. Let us take a few turns through the streets of Tours. After the steam tram, we naturally notice the horses and vehicles. Here you have one of the usual carts for carrying all kinds of merchandise, and you notice that the wheel is of much greater diameter than is the custom in this country. It is an extraordinary thing that almost all the horses one sees in France are white or grey, and generally they have a

great mass of sheepskin under the collar, frequently dyed blue. In former times Tours was famous for its silk weaving. That industry was ruined by the revocation of the Edict of Nantes in 1685. This tyrannical act drove 300 Protestant families away and the silk manufacture dwindled at Tours. This is the Grand Marché, or market, and you see two men loading this van with boxes and cases. Standing at the entrance to the market, there stretches away before us the Rue St. Martin, so-called because it passes directly through and over the spot where once stood the fine Abbey and Church of St. Martin, of which nothing now remains except those two old towers, now divided as you see by the modern street. These two towers are landmarks for miles around—the relics of one of the grandest abbeys in France, and silent witnesses to a past rich in historic and ecclesiastical memories. This domed tower containing the clock is of the 12th century; it is called the Tour de St. Martin, or the “tour de l’Horloge.” It was one of the two towers at the west end of the church. The square tower is a century older, and is called the Tour de Charlemagne, because it was erected over the tomb of Luitgarde, wife of that great emperor, who died at Tours in 800.

When I was at Tours last summer an agricultural show and a flower show were going on, and the town was generally *en fête*. Among other demonstrations there was a parade and procession of fire-brigades of this city and the neighbouring villages. Here is a portion of the procession, passing the end of my street: You notice that the firemen, pompiers, or pumpers as they are called, wear bright brass helmets. Four of them are dragging their hand fire-engine and hosepipes. The procession was generally headed by a man beating a side drum, and by a couple of buglers. The different brigades mustered some hundreds of men in procession, and caused quite an excitement in the town.

I paid a visit one afternoon to the Colonie de Mettray, some four or five miles out of Tours. This colony is a penitentiary or reformatory school for boys whose conduct has been good while in the public prisons. At the colony they are educated and taught a trade, so that they may take their places in the world as respectable members of society. This photograph will give you an idea of the arrangement of the colony. Here in the centre is a patch of ground, or square, where the boys play and are drilled. Round the sides of the square are large houses, each accommodating some 60 or 100 boys, under the care of a guardian or warder. These are each called families, *e.g.*, family A, family B, C, D, and so on. There are nine houses, therefore nine families. The houses have each a name—for example, La Ville de Paris, Ville d’Orleans, Ville de Tours. Here you see the church of the colony. Adjoining it is the priest’s house, also the school and concert-room for the boys. I

saw brushmakers, shoemakers, joiners, and so forth, all learning their trade, and all in strict silence—as a whole, I am afraid, I must say that the boys had a rather low type of face.

Here we have one of the dormitories. It is occupied by Family F, and the house is called the “Maison de Marie,” as it is the only house in the colony with a figure of the virgin. This is the daytime aspect of the dormitory, no beds to be seen.

You see the sockets on the pillars. Bars of wood are dropped by the boys into the sockets all the way along, and a hammock is quickly slung from the bars to hooks in the wall. Bars and bedding are during the day arranged along the sides of the room as you see it, and everything is as clean and neat as possible.

Attached to the colony is the “Maison Paternelle,” *i.e.*, a place where people of means send their unmanageable sons to be set straight. They are kept in solitary confinement, in well-lighted rooms, with books so that they may pursue their studies, and in turn one of the warders takes them out for exercise in the open air. Their time at the colony is spent in silence; they are known only by a number; their names are not even known to their attendants. One young fellow with a youthful beard was pointed out to me as having been sent in to cure a habit of smoking too much.

This is the interior of the boys' church at the colony. The “Maison Paternelle” joins up to the church. During mass these windows are opened, and the young gentlemen in solitary confinement in rooms on the other side of this wall can hear the service.

In addition to mechanical trades, the boys at the *Colonic de Mettray* are taught farming and horticulture. This is an instantaneous photograph, showing two of the *Mettray* boys at work weeding young vines in a small vineyard at the colony. You will notice that the boys are closed in by a wire netting, through which we are looking at them. I would refer you for some interesting details of life of this kind to an article which appeared in *Chambers's Journal* for August 1, 1892, entitled, “In a Reformatory School.”

I should have told you when we were in the dormitory that I saw some of the boys attending to the bedding under the charge of a sister or nun, who seemed to take the supervision of that work. I now show you three nuns or sisters, who superintend the laundry work at the hospital at Tours, and who were good enough to let me photograph them. I must also acknowledge the courtesy of the authorities at the *Colonic de Mettray* in allowing me to photograph there, a courtesy not often extended, I believe.

As you probably know, in France the good Sisters are much occupied in the education of the children. At their convents

they often have a day school, in which the nuns, with their general teaching, instil their religious principles. At the convent of Marmoutier, near Tours, where the Sisters of the Sacred Heart have one of these schools, I secured this group as the children came out. You see that they all have the blue blouse, and most of them the wooden sabots.

We have now a photograph of a tall isolated shaft or pillar, poised upon the precipice overhanging the north bank of the Loire, near Tours. The pillar is called the *Lanterne de Rochecorbon*. It and these bits of old walls are all that remain of a once famous chateau, built between the years 1000 and 1100, by Corbon, the first lord of Touraine. The "*Lanterne*," this square tower, served as a beacon, the fires of which would inform the garrison at Amboise in case of an attack on Rochecorbon. The rock is full of numerous caves, or rock dwellings, which are to this day inhabited by families of labourers from the neighbouring vineyards, and so forth. Similar rock-dwellings exist all along the banks of this part of the Loire, notably at Amboise, which we visited a few minutes ago. Here and there, in this strange cliff at Rochecorbon, little wreaths of smoke may be seen rising from unsuspected chimneys; one can imagine that these cave dwellings may once have sheltered persons whose religious tenets were too unorthodox for those intolerant times.

On the road running alongside the river at the foot of the rock of Rochecorbon I photographed this group—two housewives having a deal with the greengrocer, who is wearing the usual blue blouse of the peasants. It shows that the greengrocer's cart is as familiar an institution in the Loire valley as in our English villages.

Turning again into the town of Tours, and walking up a narrow and tortuous street, we come to the house of Tristan l'Hermite, a gentleman who was the frequently-employed hangman of Louis XI. For a graphic account of this same Tristan and his relations with Louis, let me refer you to Sir Walter Scott's "*Quentin Durward*." The house has a very picturesque old front, with its elegant gothic doorway. The house is decorated with a twisted cord, which some people put down as an obvious badge of Tristan's office; but we must also remember that the twisted cord was a favourite badge of Anne of Brittany.

We visit one other old house in Tours—the *Maison Gouin*, or the *Hotel Gouin*, and of this you now have a photograph. This house was built in 1440, and is a beautiful example of early French Renaissance. This *Maison Gouin* is a bank, the oldest and most important banking house in Tours. Here it was that I changed my English notes into French money.

Our last view in Tours is the west front of the

cathedral. It dates from the end of the 15th century. You see that the whole façade is covered with elaborate ornament, and has an appearance of great richness. The three lofty portals are enriched with florid ornaments, niches, and foliage. In the niches are many sculptured figures. Over the central portal is a large eight-light window. The head of the window, instead of being a rose or wheel window, represents in outline four pointed arches. It is filled with the finest glass. This Cathedral contains the beautiful tomb of the two children of Charles VIII. and Anne of Brittany. An idea of the height of the building is formed by comparison with the persons in the doorway.

Continuing our journey we arrive at Loches, and before entering the town visit the ruin of a Benedictine monastery, situated in the suburb of Beaulieu. Here is the north wall and one of the western towers of the ancient Conventual Church. The tower is said to date from 902, and is therefore nearly 1,000 years old. The abbey was built by one of the early Counts of Anjou, Fulk Nerra, called the Black Falcon, ancestor of our Plantagenet kings. He was buried here.

If we stand in the vacant space, formerly the church, once closed in by the roof now gone, we get the view shown in the next photograph. It is the house of Agnes Sorel's uncle. One of the most interesting, certainly the most poetical memory connected with Loches, is the memory of Agnes Sorel. She was the favourite of Charles VII., of Joan of Arc fame. Agnes Sorel was called "la belle des belles," the queen of beauty. Old chroniclers say that she was as good as she was beautiful; her influence with the king was always on the side of good and of patriotism. Even Charles' queen, Mary of Anjou, instead of being jealous, recognised the high qualities of Agnes Sorel. As we gaze at this house, which often sheltered her head, let me quote a verse, written 100 years later, by Francis I., he of the Renaissance, and which shows the estimation in which her memory was held—

"Gentille Agnès, plus d'honneur tu mérites
(La cause étant de France recouvrir)
Que ce que peut dedans un cloître ouvrir
Close nonnain ou bien devot hermite."

This verse of Francis I. has been metrically translated thus—

"If to win back poor captive France be aught,
More honour, gentle Agnes, be thy meed,
Than ere was due to deeds of virtue wrought
By cloistered nun or pious hermit breed."

We enter Loches through this ancient gateway, which formed part of the fortified walls of the town. You see very clearly the

long openings or slits through which the long levers worked up and down for raising and lowering the drawbridge. Above are the machicolations from which boiling oil could be poured upon the heads of besiegers.

Our next view is the ancient Donjon Keep of Loches. Rising as it does on the summit of a rock, an American writer describes it as "one of the greatest impressions of central France." You may judge of its antiquity from the fact that we read of a Count of Anjou acquiring it by marriage in 879, more than 1,000 years ago. This castle is of absorbing interest to Englishmen, for it was the cradle of our Plantagenet kings. It contains horrible dungeons cut 100 steps down into the solid rock, to which a scanty ray of light found entrance through a narrow slit pierced through 14ft. thickness of rock. In one of the chambers may still be seen the staple from which was suspended the iron cage in which Louis XI. imprisoned the Cardinal La Balue. This cage is no myth, for the charges for making it are still to be found in Louis XI.'s accounts. On one of the prison walls are scratched the words: "Entrez Messieurs, chez le Roy nostre maistre."

To obtain our next view we mount to the top of this grand old Keep. Its walls of perfect and even masonry rise to a height of 128ft. Below us lie the ancient Collegiate Church, and beyond that the more modern chateau of Charles VII. and Louis XII. Notice this church, the church of St. Ours, more commonly known as the "Eglise Collégiale." The church has no roof in the ordinary sense of the term. The nave is closed in by these two pyramids; they are hollow and open to the church, and standing in the church the sight is lost in the gloom of the apparently unlimited space above our heads. The effect is weird and impressive, and we shall probably agree with the French writer Viollet le Duc, that "it is a monument unique in the world, perfect of its kind and of savage beauty." Here you have the large western doorway of this curious church. It is early Romanesque work, and is richly covered with primitive sculpture, much worn away by the ravages of time. An interesting object on the right of the door is this Roman or pagan altar, embossed with carvings of fighting warriors. It is now used as a benitier, or vessel for holy water.

At the later Chateau of Loches, we have only time to peep into one tiny chamber. It was the oratory or private chapel of Anne of Brittany, the queen of Louis XII., and here you see the broken altar recess. The wall is festooned over with the cord, the badge of Anne, which we have noticed before. Below this spot, enclosed in a very narrow turret, is the exquisite tomb of Agnes Sorel. As Agnes is said to have completed the work for Charles VII. that Joan of Arc began, I make no apology for again alluding to her. Hidden in the dark turret, it was im-

possible to photograph the lovely figure recumbent on the tomb. Suffice it, then, to quote part of the inscription—

“Une douce et simple colombe plus blanche que les cygnes, plus vermeille que la flamme—son visage avait l'éclat des fleurs en printemps.”

That is—

“A sweet and artless dove, whiter than the swan, more crimson than the flame—her countenance had the brilliance of the flowers in Spring.”

As we depart from Loches we see, almost next door to the station, this present-day view. It is interesting to us Lancashire people, because it is nothing more or less than a cotton mill, getting its water supply from the Indre, an affluent of the Loire. Cotton mills seem to be springing up more and more in different parts of the continent in competition with our own mills.

Our journey now carries us to Azay-le-Rideau, perhaps the most beautiful and perfect of all the chateaux of Touraine, and to which I referred when indicating its position on the map, as the “bijou” chateau. For beauty of detail, Azay-le-Rideau comes after Blois and Chenonceaux, and before Amboise and Chambord, but of course it is inferior to those vast structures in size and majesty. It was built about 1526, in the reign of Francis I. It is described by the Abbé Chevalier thus: “Azay-le-Rideau is perhaps the purest expression of the beautiful French Renaissance. Its height is divided between two storeys, terminating under the roof in a projecting entablature, which imitates a row of machicolations . . . turrets on brackets, of elegant shape, hang with the greatest lightness from the angles of the building.”

This is the façade seen as we approach: we now pass round to the further or rear façade. Theodore Andrea Cook writes: “To few houses is it given as at Azay-le-Rideau to escape decay, and yet preserve the mellowed beauty of the past—a mellowed beauty which is something different from any hues, or colourings, wrought by the hand of man.” The chateau, which now belongs to the Marquis de Biencourt, contains a magnificent collection of portraits; they include almost all the great names of which we have heard this evening.

On entering Langeais, the little town on the north bank of the Loire at which we now arrive, I saw this old woman busy with her laundry-work in a side stream or bye-wash of the main River Loire. I suppose the old crone, whose sun-browned face makes her cap the more dazzlingly white, found the usual stooping and kneeling irksome; she has therefore provided herself with a table. Notice the perfect reflection of the arch in the water.

As we pass along the little street, there rises before us, out of the very centre of the village, perpendicular and massive, the

old castle of Langeais. The castle, as it at present stands, was built in 1464, in the time of Louis XI. It was occupied by the English during those invasions of France, when Edward, the Black Prince, made his campaigns along the valley of the Loire, culminating in the battles of Cressy and Poitiers. You see the great levers for raising and lowering the drawbridge; they work up and down in long slots, such as we saw at Chaumont and Loches.

We now pass through this doorway and enter the inner court of the chateau. The great event of this chateau of Langeais was the marriage of Charles VIII. and Anne of Brittany, which took place in the great hall here in 1491, with great splendour.

Charles died suddenly at Amboise seven years later, from an accidental blow on the head received while passing through a low doorway, in the same spring which saw the martyrdom of Savonarola at Florence, and Anne of Brittany was left free to marry Louis XII.

Notice the extreme regularity with which the flowers are planted, making the garden resemble the pattern of a carpet, or an oil-cloth.

We now travel on to Chinon, and get a general view of the town and castle from across the waters of the Vienne, a tributary stream of the Loire. At Chinon we have the ruins of an old feudal castle, dating from the times of our early Norman kings. You see the great size of this old castle, covering, as it does, almost the whole of the cliff above the little town. As Loches was the cradle of our Plantagenet kings, so was Chinon here their French Windsor—indeed Henry Plantagenet died here. Chinon became the favourite residence of the French kings, until the time of Charles VII., who here received Joan of Arc in 1429.

Crossing by this bridge over what was originally the moat, we enter the castle under this tower, called the Tour de l'Horloge. Here the royal apartments—here a 13th century tower—and here, on the extreme left, the Tour de Moulin, the cornmill tower, so called because it was surmounted by a windmill, which ground the corn for the use of the crowd of royalties, servitors, and garrison which in those days occupied the castle.

Chinon is a quaint old town. As we climb up to the castle let us pause in this old street, the Rue St. Maurice. In this town of Chinon was born, in the year 1490, the great French poet Rabelais, of whom a writer has said that "his great characteristic was the great human feeling and the love of human

berty which only assumed the cap and bells of folly to secure a hearing, or to be sure of safety" at a time when an unwitting word so frequently placed a man's neck in jeopardy.

Do you remember the story of Joan of Arc? In 1429 the English were masters of a great part of France, and were actively

besieging Orleans. Joan was a good, simple, gentle girl, occupied with her spinning-wheel and in tending her father's sheep. One day, while in her father's garden, angels seemed to appear to Joan, and she seemed to hear a voice bidding her "go to the King of France for to deliver the kingdom." Joan dared not resist the command, so set out to walk from her home at Domrémy, in Lorraine, to Chinon, where the king was, a distance of 150 leagues. Joan took eleven days over the journey, pushing on, disquieted by no difficulty or danger.

This ruin shows all that is left of the hall in which Charles VII. received Joan, and we may well believe that all her courage was needed to support her under the cold and cynical reception which she found in return for her enthusiasm, and to enable her to bear the indifference of the king, the insolence and opposition of his counsellors, and the whisperings of a licentious court.

The king did not see Joan again for six weeks, during which time she was lodged in this tower, the "Tour du Courdray," seen through the trees. At that time, this grassy foreground was covered by the Chapel of St. Martin, into which Joan used to come from her tower during her six weeks of waiting, and pray for the success of her mission.

You know how Charles VII. was persuaded of her divine authority, and how he equipped her and gave her the command, and we saw how victorious she was over the English forces when we visited her statue at Orleans. The French soldiery regarded her as inspired by heaven; but when she was taken prisoner by the English she was, to their shame, burnt at the stake as a witch.

Chinon remained the property of the French Royal family until the year 1631, when, by a subterfuge, Cardinal Richelieu, as prime minister, sold it to himself as purchaser, and it was Richelieu's family that allowed this venerable and historical castle to go to ruins.

In leaving Chinon we bid farewell to the famous Chateaus of Touraine, and entering Anjou, we halt at Saumur, one of the most picturesque towns on the Loire. This photograph of the Saumur bridge was taken from one of our windows at the hotel. It gives you a very fair idea of the width of the Loire, which here is still about 100 miles from the sea. We now step down to the middle of the bridge, from which we get a general view of Saumur.

Saumur was always a Protestant stronghold. After the St. Bartholomew massacre, Henry III., with the view of reconciling the Protestants and Catholics, gave this town of Saumur to Henry of Navarre, afterwards Henry IV., the Huguenot leader. His governor was established in this castle, and he ruled so well that Saumur became a flourishing town of 25,000 inhabitants. The revocation of the Edict of Nantes put a stop to this

prosperity by expelling the industrious Huguenots, many of them weavers, who fled mostly to Holland, some to London, and other places. The population was reduced to a quarter of its former number, and to-day is little more than 13,000.

Here is the Church of St. Pierre, and here on the right is the ancient Hotel de Ville or Town Hall, a quaint building with peaked roof and turretted angles, dating from the 16th century. Between the buildings and the river is an open space used as a market, in which I got this little group. You see the old woman in her white cap, comfortably seated at her stall, bargaining keenly with the purchaser, whose head is turned in an argumentative kind of way. Notice the market stall; it is like a table raised on short legs, instead of the more usual boards laid on tressles. These market stalls are very portable, being frames suspended from the shoulders for facility of carrying. Here you see one of the market girls, after the market, carrying home her shop or her stall. It enables her to carry two empty milk cans and a long shallow basket used for vegetables. She has turned her head to call out a parting word, and that enables you to notice the cap worn by the peasant women in this part of Anjou.

A little distance out of Saumur stands the largest and best-preserved Druidical remain, or Cromlech, or Dolmen as it is called in this part of France. It is a little suggestive of Stonehenge, or of Kit's Cotty house in Kent. Huge blocks of unhewn stone set upright, with others laid across them, compose a chamber 64ft. in length. There are fourteen stones, and the largest measures 24ft. by 21ft., and is 2ft. 9in. thick. The use of this Cromlech or Dolmen in those remote ages, whether altar, temple, palace, or prison, is matter for conjecture.

Moving onwards 28 miles we arrive at Angers, the old capital of Anjou. Entering the town, we pause before the west front of the Cathedral of St. Maurice, to notice the primitive Gothic portal, which dates from the 12th century. The carving over the door represents the Saviour surrounded by the attributes of the evangelists. Above are eight statues of the companions in martyrdom of the St. Maurice, the patron saint. The west front is surmounted by lofty twin tapering spires containing the bells. The buildings surround us too closely to admit of our photographing the towers. But if I cannot show you these towers, I can take you up into one of them. After a fatiguing climb of 237 steps, we find ourselves on a level with the bells, of which there are a peal of nine in this cathedral. Here you see the largest of them. It weighs 7,750 kilogrammes—*i.e.*, 7 tons 13½ cwt. This clapper weighs 8 cwt. The big clock strikes on this bell. I was up here on the 10th of last June, when the clock struck nine and ten. The effect was electrifying; standing so close, the vibration went through and through one, and seemed to shake one to pieces! It had so remarkable an effect upon a

young fellow who was with me that, for a moment, I could not tell whether he was going to be sea-sick, or whether he would try to precipitate himself from the parapet into the street below!

We now have the view from this tower, looking S.W. over the city. (This river is the Mayenne, a tributary of the Loire, which is near.)

You see that nearly the whole width of our view is occupied by the remains of the castle of Angers, anciently the fortress of the Counts of Anjou. It is recorded of one of them, Fulk the Good, that when mocked by his royal master for his studious habits in those days of rapine and violence, he replied, "*Rex illiteratus est asinus coronatus*"—*i.e.*, "The unlearned king is but a crowned ass."

This castle was the stronghold of Geoffrey of Anjou, the father of our Henry Plantagenet. Let us descend to the level of the street. This large castle had originally seventeen huge round towers, each 80ft. high, but they were much broken down at the end of the 16th century; and to-day we can realise the words which Shakespeare put into the mouth of King John, speaking of Angers—

. . . "those sleeping stones,
That as a waist did girdle it about,
By this time from their fixed beds of lime
Have been dishabited."

In this connection let me say that it is interesting to read Shakespeare's play of King John, as so much of the scene is laid at Angers, then called Angiers. The walls and the town are chiefly built of blocks of slate, which gives it so dark an appearance that the place earned the title of "Black Angers." Notice the curious lines formed in the castle walls by an occasional course of lighter-coloured stone.

Here on the right is a bronze statue, by David of Angers, of King René of Anjou, poet and musician. He was the father of the heroic Margaret of Anjou, wife of our English Henry VI.

We now call at the Préfecture of Police, to see a quaint old colonnade or arcade, which the courtesy of the keeper of the Archives allowed me to photograph. As you see, the pillars, cornices, and mouldings of the arches are elaborately carved—no two alike—foliage, grotesque animals, fish, and so forth. It is an interesting relic of a bygone age, upon which the hand of time has exercised its softening touch.

In this building I was shown documents, brown with age, bearing the actual signature of Catherine de Medicis, and others of the great names with which we have come in contact this evening. In this photograph you have what I think I may safely characterise as the best piece of ancient domestic architecture in Angers. It is called "*la Maison d'Adam*"—the house of Adam. The ground floor is the shop of a linen draper, who

has put up the enterprising sign "*la Mère de Famille*." Though of course much restored, this gabled, elaborately-timbered, remarkable old house may be considered, as one writer expresses it, "a really imposing monument."

At Angers I made the acquaintance of a French officer, a captain in the *Cuirassiers*—that ornamental cavalry regiment, you know, who wear a steel cuirass and a long black horse hair plume down their backs. The title they gave my friend was: "*Monsieur le Capitaine chef de l'escadron*." Here you see him, in undress uniform, seated on his brake, his wife with him.

One afternoon he drove us to the slate-quarries of Trélazé, a few miles out of Angers. These quarries are of enormous extent, said to be the largest in Europe. In this photograph you have one of the workings between 300ft. and 400ft. deep. You see the tram lines, and the trucks, and how small the men seem to be in the workings. Similar workings extend for a distance of nearly three miles, and give employment to about 3,000 workmen. They turn out some 80,000,000 of slates per annum. The surroundings are not so picturesque as those of our Welsh slate-quarries, but it is interesting to see their French competitors.

Our last view at Angers is of a picturesque old tower standing on the river bank, on the east side of the town. Formerly it was no doubt for the protection of the city, and a defence from any attack by water from the higher reaches of the river.

The last stage of our ramble from Orleans to Nantes, about 55 miles, we will do by river steamboat.

You remember Anne of Brittany, who was twice made Queen of France. At the time when her second husband, Louis XII., fell ill, the *Maréchal de Gié* was governor of Saumur and Angers. Now de Gié wanted the Princess Claude to marry the young Francis, afterwards Francis I., but Anne wanted her to marry the Prince of Germany. Anne and de Gié were therefore at cross purposes. Anne, business-like little Breton that she was, in view of a probable widowhood, which was not realised, sent jewels and valuables by boat down the Loire to her Duchy at Nantes. De Gié, being master of the river between Saumur and the Angers stream, used to stop the boats, and detain the queen's valuables, to her intense annoyance. Eventually matters came right, for the Princess Claude was married to the future King Francis.

This is a view on the Loire at a point where it is joined by the Mayenne below Angers, taken from the deck of the steamer. These views give you a good idea of the width of the Loire, and here we must still be quite 50 miles from the sea.

This is an instantaneous photograph from our steamboat, and it shows you the kind of vessels that navigate the Lower Loire—a great length of boat, with a tall mast about the centre,

carrying a huge square sail. They seem well-adapted for the river traffic, and accommodate a large cargo.

The railway runs along the right bank of the river, and does the journey in about a quarter the time of the steamboat. Early this year the railway fares were reduced.

This seems to have deprived the river steam boat of all its passengers, and made it so losing a business that the boat was to cease running the week after I was there, in the middle of June, 1892. I am, therefore, perhaps able to show you river views on the Loire, which you may never be able to see yourselves.

This is the way passengers are brought to the steamboat from the little villages on the river banks. Here is the solitary passenger, being rowed by this man and woman to the steamboat, to which they hang on by a boathook while passengers are transferred.

Let me now introduce you to some of the passengers on our little steamboat. There are only few of them, and they are mostly the country folk. Here is a man in his blue blouse looking over the side of the boat. The caps of the two women proclaim the districts from which they come. The woman on the right comes from Anjou, *up* the river, while the woman on the left wears the curious Breton cap projecting behind, which tells that she comes from Brittany, away *down* at the mouth of the river. Their faces are quite brown from the sun and weather.

A small awning protects the steersman from the sun, whose rays beat down very hot here in the middle of France at noon on a summer's day. They are regardless of any such rule as it being forbidden to speak to the man at the wheel—as a consequence, perhaps, the boat frequently grated the bottom in the shallow parts of the river. How animated the conversation was I leave you to judge from this instantaneous photograph.

We now arrive at the last stage of our journey down the Loire—the old city of Nantes. At Nantes the river divides into several channels through the town, the different parts of which are connected by at least eleven bridges, and we have approached so near the sea that we have reached tide-water.

Before us stands the old castle of Nantes, of which the greater part has been modernised by the utilitarian French into a soldiers' barrack. Charles VIII. and the succeeding French kings nearly all took up their abode for a time within these walls. Here, too, Anne of Brittany was born; and in the chapel of this castle Anne was married to Louis XII., and so became, as you know, for the second time Queen of France. We heard of her first marriage, you may remember, with Charles VIII. at Langeais.

In this castle, in 1598, Henry IV. signed the Edict of Nantes which gave protection to the Protestants. That edict was

revoked 87 years later by Louis XIV., greatly to the injury of France. I could tell you much about the Chateau of Nantes, but time obliges us to pass on.

Behind the castle stands the Cathedral, of which the chief feature is the west front shewn in this photograph. The three lofty portals are of great size, as you will notice if you compare them with the height of the persons standing on the steps and with the lamp posts. The portals are ornamented with a large number of small carvings and sculptures. The Cathedral was finished in the 15th century.

The Nantes of to-day possesses many fine buildings, of which I now show you one, the Palais de Justice or Law Courts. The very name of justice recalls that hideous parody of justice which was enacted here in Nantes only 100 years ago, in 1793, and without some mention of which any reference to Nantes would be incomplete.

The single executions of the guillotine could not satisfy with sufficient rapidity the thirst for blood of Carrier, who was, perhaps, the most detestable monster of the first French Revolution. Carrier invented the "Noyades," in which, after the merest shadow of a trial, some 20 or 30 of the Nantes people were towed out into the middle of the Loire, precipitated into the water, and drowned indiscriminately—men, women, and children.

When remonstrated with for killing the children, Carrier replied: "They are the wolfings, and must be destroyed; they are vipers, and must be smothered." 6,000 to 9,000 persons are said to have perished in these "Noyades" here at Nantes. Let us be thankful that our lot has not been cast in an age of such savagery! You may read a little story of that cruel time in this locality in the *Strand Magazine* for November, 1892, called "Ugly Margot."

Swinburne, whose name has been mentioned as a possible successor to the Laureateship, has written a poem which I commend to your notice, called "les Noyades." It is supposed to be the last words spoken by a man after receiving the sentence from Carrier, to be bound by cords to a lady who had slighted his proffered love, the two to be then thrown into the river, and so drown together. It is, if exceedingly painful, a powerful poem, and, as we wander along the quay side, I will read to you the last three stanzas—

"For the Loire would have driven us down to the sea,
And the sea would have pitched us from shoal to shoal,
And I should have held you, and you held me,
As flesh holds flesh, and the soul the soul.

"Could I change you, help you to love me, sweet,
Could I give you the love that would sweeten death
We should yield, go down, locked hand and feet,
Die, drown together, and breath catch breath;

"But you would have felt my soul in a kiss,
And known that once, if I loved you well;
And I would have given my soul for this
To burn for ever, in burning hell."

We now come to our last photograph, a view of the Loire at Nantes, looking west towards the open sea, still some distance away. Here, as you see, they get ocean-going ships; in fact, Nantes is now a very busy port. Wheat, flour, wine, hemp, are largely exported to England. One-fourth of the trading vessels of France are built at Nantes; preserved meats and fruits are prepared here, and there are some cotton mills and iron foundries. You will judge of the climate here when I tell you that we approached this spot through an avenue of camellia trees, with thick trunks, and bearing principally white flowers.

We have now travelled some 200 miles down the valley of the Loire, from Orleans to Nantes, every mile of which seems to have played an important part in French history, and, indeed, very largely in our English history. As we passed by I have tried to re-people, as it were, their ancient castles and palaces with the principal figures of those stirring times, and may I venture to hope that, in the poet's words—

“For a short space
We saw revealed the double threads that bind
This little speck of time we call ‘to-day’
To the great cycle of unending life
That has been, and shall be for evermore.”

The Antarctic Whalers.—A telegram from Monte Video on January 13th brings news of the progress of the Dundee whalers towards the Antarctic regions, and reports that all on board were well. The despatch of the fleet from Dundee in the beginning of September last was noticed in the “Proceedings” for 1892, p. 862. The *Balæna*, which was supplied with the most complete equipment for scientific work, reached Port Stanley, in the Falkland Islands, in the end of November. The *Active* arrived on December 8th and the *Diana* on the 11th. The *Polar Star*, which had not instructions to call at Port Stanley, was spoken off the River Plate on November 16th, all well. She reported having had light winds and calms, a state of weather which accounts for the protracted voyage of all the ships. We hope to receive letters giving some account of the preliminary scientific observations in a few weeks, although, of course, it will be several months before the results of the work in the Antarctic ice can be known.—*Proceedings of the Royal Geographical Society*, February, 1893.

The New Survey of France.—A paper read to the French Topographical Society by M. Ch. Lallemand, the Chief of the Levelling Service, and published in the *Revue de Géographie*, for January and February, gives a masterly summary of the methods and results of the great work which has just been completed. The levelling was of a very high order of precision, and the accumulated error between Marseilles and Lille could not exceed 2in. The mean level of the sea was obtained by the use of specially constructed recording tide-gauges, at more than forty stations on the Channel, the Bay of Biscay, and the Mediterranean. The result of these determinations, connected by the land levels, showed that there was no appreciable difference in the mean level of the sea on the three coasts of France, the greatest observed differences being only a few centimetres. Suitable bench-marks are now being put in position all over the country, and a complete index of these, specifying the exact elevation, will shortly be published.—*Proceedings of the Royal Geographical Society*, March, 1893.

THE YORUBA COUNTRY, ABEOKUTA, AND LAGOS.

BY THE REV. J. T. F. HALLIGEY, F.R.G.S.

[For Map see Vol. V., p. 255.]

[Addressed to the Members, in the Memorial Hall, Wednesday, February 17th, 1893,
at 7-30 p.m.]

THE reluctance alluded to in the ticket issued for this address has arisen chiefly from a feeling of unfitness to present to such a scientific assembly as this anything worthy the sacrifice of its time to hear. My travels and residence in West Africa were not in the pursuit of science, but to fulfil the simple prosaic duties of a Christian missionary. To secure occasional recreation I indulged a little in amateur photography, and am thus enabled to present a number of original views and portraits, some from districts never before exploited with a camera; and if looking on a few of my pictures and listening to my homely chat will interest you, I shall be gratified and honoured.

SIERRA LEONE.

No sooner does the West African voyager reach Sierra Leone, usually the first port of call, than he is made aware of the existence of that remarkable individual, the Kru-boy. You smell him, you hear him, you see him, you touch him, and you must be exceptionally favoured if you do not also taste him. I venture to say that most old West Africans have at times detected a certain flavour in their soup, which, if the Kru-boy is not responsible for it, remains an enigma to this day. But, good old Kru-boy—we could not get on without him. How patiently he will sit beside his task with a pensive and contemplative cast in his features. He never steals—no never—except when Massa does not happen to be watching. And as for his voice, who that has heard it once can ever forget it. The vocal organs of the Kru-boy form one of the inscrutable mysteries of Providence. His most beatific vision is the prospect of plenty of “chop” (food), and if Massa will not stint him, you may travel far and wide before you will find a more good-tempered, amusing, loyal and devoted servant than the Kru-boy. On the West African coast he is indispensable. Hence, I beg to give him the place of honour by introducing him to you first of all.

KRU CANOES.

Soon after leaving Sierra Leone on the outward voyage we reach the Kru-boys' native land. As the steamer approaches within four or five miles of the treacherous coast, the slowing down of speed, the hoisting of certain flags, and sometimes the firing of a gun is a signal to those on shore that Kru-boys are wanted. Accustomed eyes see the frail dug-outs with their tapering ends approaching, looking like storm birds rising and falling with every motion of the sea. Soon they are alongside, and, oh! the scene! Shrieking, howling, fighting, canoes colliding and upsetting, but apparently as much at home on the sea as on land, they squabble with tempestuous onteries, a vocal tornado of human passion.

KRU-MEN ON BOARD.

When they get on deck, a bargain is struck with the headman accompanying each group. The Krus, who, by the way, are commendably proud of the fact that they have never been enslaved, are engaged for short terms of service by the merchants further down the coast. I show you a group just taken after the negotiations were concluded with the captain and the man with the tall hat. This old fellow, who had appropriated the very suggestive name of Tom Twoglass, came on board apparently with nothing on save a wonderful bundle on the top of his head. But, unfastening two or three knots, his attire arranged itself, and he appeared in all the dignity with which sartorial science distinguished him as a man of position in his tribe.

WEST AFRICAN SURF.

After leaving Sierra Leone there is no harbour or quiet roadstead where one may land in comfort. For thousands of miles along the coast is the eternally raging surf, which renders landing an operation always of excitement, and sometimes of real peril. The boatmen are, however, by long experience exceedingly skilful, and fatalities are rare.

LAGOON SCENE.

A special feature of the West African coast is the lagoon formation, running for the most part parallel with the shore.* In some places only a few yards of sandbank divide the placid water from the wild, dangerous surf which ceaselessly rolls and thunders on the strand. At Lagos there is an arm of the lagoon which broadens out into a sheet so wide that it cannot be seen across. Several rivers empty themselves into this basin, one being the Ogun, up which canoes navigate to Abeokuta. In this picture is shown a large mass of mud covered with grass,

* See Mr. Millson's admirable paper and map of the Lagoons, *Journal*, vol. v., p. 333.

and floating down with the current. These "floating islands" are frequently seen. They become detached from the low, swampy banks, and now and then they bear a snake, or some other reptile, who has an unchartered and undesirable trip to the sea.

Sometimes these islands float on to a shallow place, and before any change can occur in the depth of the water the grass-roots strike down, anchor the truant, and the island becomes stationary.

Lagos, the great trade emporium of West Africa, was ceded to the Crown in 1861. Previous to this date it was a notorious slave depot, in the barracoons of which gross villainies were constantly perpetrated. The exercise of British rule soon effected a wholesome change. From our older settlement of Sierra Leone numbers migrated, and the transformation of Lagos from a den of infamy to a thriving, well-ordered community was rapid and thorough. Two or three of the buildings erected within the last ten years will illustrate the progress from one point of view.

CHURCHES.

A Roman Catholic Church and two Wesleyan Churches. The latter were erected at a cost of about £4,000, every farthing of which was contributed by the Lagos people and their friends.

HOUSE OF NATIVE MERCHANT.

Some of the native merchants after a visit to this country—which they are fond of calling HOME—have so fully appreciated the comfort and style of our mode of living that they pay us the sincerest flattery by faithful imitation. Another token of progress was fully illustrated by Mr. Alvan Millson in a valuable paper which he read to the Manchester Geographical Society in June, 1891.* In that paper he stated that "about a million and a quarter in value of produce and goods pass to and from Europe every year," and that were the interior delivered from the curse of its chronic unrest, the trade could easily be trebled. To this I can only add that, in my judgment, Mr. Millson's estimate is much too modest.

It is now time for us to start for the interior. The luggage must be carefully packed into loads of some 60 or 70lb. in weight. There being no luggage trains or carriers' vans available, native porters are employed who bear the burdens on their strong sound skulls. Getting ready for the interior journey requires thoughtful preparation. There are no hotels where one may lodge and be catered for, neither are there stores along the route where a forgotten article may be supplied. Everything, therefore, must be thought of, provided, and packed, so that

* See *Journal*, vol. vii., p. 92.

what is soonest wanted may be easiest found, clothes, food, cooking vessels, beds, cumbrous cowries or native money, presents to dignitaries, and articles of barter.

Taking the land journey to Abeokuta, and following as closely as possible the route which Governor Carter has selected, we cross the lagoon from Lagos, and in half an hour land at Ebute Metta.

EBUTE METTA,

or, the three landing places. This is a fair-sized native village with a large market, and a most interesting botanic garden, which the Government wisely supports. The greater part of the country between Lagos and Abeokuta is brought under a primitive kind of cultivation, and several villages are met with on the journey. At some of these the porters halt to rest and eat.

PREPARING FOOD.

Every family has its huge pestle and mortar, with which most of the food is prepared. One of the chief food products is the root of the cassava plant, which, after being pounded into a stiff dough, is boiled and eaten with fish, vegetables, pepper and palm oil.

The weary travellers sit around watching the women with deep interest as they diligently get ready the evening meal.

One part of the road is still covered with virgin forest. The path is only wide enough to admit of walking in single file. A strange silence prevails in these sylvan shades, which the occasional rustle of dry leaves or twitter of birds seems only to emphasize. Trees often fall across the path, and are mostly left to rot, while travellers walk around the obstacle and thus form another twist to the crookedness which is so characteristic of all African ways.

British territory extends Abeokuta-ward to Agagé, a little village about 20 or 25 miles from Lagos. Up to this point the country is practically level, and is chiefly under cultivation. But soon after leaving Agagé there is a steep descent along a path of hard red clay, which the rains have cut into a V shape, and progress is much retarded thereby.

OLO WATER

Five miles beyond is the Olo stream, which at the crossing place broadens to about 100 yards, the water being comparatively clear. The native porters seldom fail to halt after safely depositing their loads on the further bank, and disport themselves in the refreshing pool. Within half an hour from this spot is the important town of Otta. Formerly Otta was the capital of an independent state, but, conquered by the Egba chiefs, it has ever since been subject to Abeokuta. Between

these towns the road winds through a country which, within the last few years, has been largely cleared of its forest and thick brush in order to be put under cultivation. This road being west of the River Ogun, while the Egba capital is on its left bank, there are three or four crossing places which in the dry season can be easily forded without the aid of canoes.

ARO FERRY.

The ferry or fording place nearest the town is called Aro. There is another ford at Titi, five miles below, which is even more frequently selected by travellers from and to Lagos. But before reaching these fords there are two or three swamps which intersect the road where slimy and rotting trees, and soft, stenchy mud are a source of discomfort and danger. More than once I have seen the hapless wayfarer miss his footing on the slippery log and sink to the waist in the black and fetid ooze.

ARO GATE.

Stretching away for a mile or more on the south side of Abeokuta is a grassy plain, where on two or three occasions desperate fighting has been witnessed. Again and again the Dahomians have attempted the capture of the town, but on each occasion were repulsed with heavy and well-merited discomfiture.

ABEOKUTA.

Abeokuta is a town of modern origin, situated among high hills and picturesque groupings of granite rocks. It is surrounded by a clay wall about 15 miles in length, forming an irregular semi-oval, with the river for its base, and enclosing an area about $3\frac{1}{2}$ miles across. The wall is on the inner edge of the trench from which the clay was dug to build it with, and is pierced by 13 or 14 gates, the principal ones being in charge of men who levy arbitrary and uncertain tolls on goods and strangers passing through. The wall-enclosed area, however, is not by any means covered with human abodes—there are several large spaces on which nothing is to be seen but huge boulders and outcrops of granite, and a thick scrubby bush.

THE OLUMO.

Almost in the centre of the town is a singular pile of rocks, with caves which at one time were the hiding-place of a desperate horde of bandits. About seventy years ago the Egbas dwelt in villages and small towns, which at that time were sadly harassed by war. Doubtless the tribe would have perished but for the sagacity of a chief named Shodeke. He persuaded his people to give up their precarious village life, and to group themselves in one compact town for mutual defence. Choosing localities

around the Olumo, each little township formed a separate settlement, a distinction which is preserved to the present hour, yet all were welded into one by the encircling wall. Thus lying around the great rock Olumo, the town received its name, Abe-okuta, or, under the stone.

DEVIL HOUSE.

Notwithstanding the successful work of the missionaries, the majority of the people are sad idolaters, and the practice of human sacrifice has lingered up to the present time. It will be noticed that Governor Carter, in his recent treaty with the Egbas, has stipulated that this cruel practice shall cease.

Not only in the Egba country, but in all the West African towns and villages, are little clay houses dedicated to the use of the devil. The heathen fear their gods more for the evil they are thought capable of working, than they love them for the blessings they might confer. Regarding them as mischievous they prefer their room to their company, so these little places are erected outside their dwellings and food placed within them each night for the convenience of their deities, if, on their travels, they should have to pass that way.

THE WAR CHIEF OGUDIPÉ.

For many years the most influential notability in Abeokuta was an old war chief called Ogudipé. Refusing to be made the king or Alaké, he adopted a new title, Alatonshé, or the man who puts things in order. The principal authorities are the Ogbonis, or civil chiefs, among whom is practised an elaborate ritual of a freemasonry character; and the Jagunas or war chiefs.

When I was there in 1887 I became, unwittingly, the cause of great stir in the town. Unknown to the Ogbonis, the Jagunas sent a number of men, about 120, armed with guns and cutlasses, to raid our mission premises. Old Ogudipé was greatly annoyed with the wanton outrage, and sent his staff to us as a symbol of our being taken under his protection. We tested its value the next day when our assailants returned with still grosser insolence, but, after seeing the outward and visible symbol of the Alatonshé, ventured not to go beyond verbal abuse.

Ogudipé was not only a brave warrior but a very skilful mechanic—quite an artist in metal work. This staff with its curious figures was made of brass by his own hands, and, when sent to me, had a feather stuck in one end, which meant, "Like a bird, I come to you quickly."

Ogudipé was also endowed with the poetic afflatus, and composed many songs, to which he set his own music. It was a favourite recreation of his to have a choir practice with the most dulcet voiced of his numerous wives. During the period of trouble to which I just referred, I found him engaged in one

of those interesting rehearsals. About 25 of the ladies were seated under a low shed, while their husband and master was on a mat facing them about three yards in front. He honoured me by improvising a song both with words and music, and spent half an hour in teaching it to his obedient and admiring choir. I regret that I cannot reproduce the music, but the following is a translation of the song, which was accompanied by a rhythmic and gentle swaying of the body and clapping of their hands. It alluded to the event which was then the great topic of the day—

They who destroy other men's houses really destroy their own ;
 The war chiefs sent their men to pull down the houses of the white man.
 The houses of the war chiefs must now come down.
 Cowards and thieves these war chiefs are.
 Strangers who visit us in peace they plunder.
 Ah ! when the Dahomians come, these chiefs will flee.

SHODEKÉ'S PLACE.

I have already alluded to the great chief Shodeké. Close to where he resided is a large open square, where from his time down to the present the great meetings of the Egba Witanagemot have been held. It was here that I had to appear to have the charge of intrigue with the Dahomians investigated. The first two hours of the proceedings were occupied by a most interesting diplomatic discussion between the civil and the war chiefs. The former were seated under a shed to the left, the Jagunas sat beneath the tree on the right, while I was placed beneath a sloping tree in the centre. Each set of chiefs had an orator, who received his instructions in a whispered conversation with his own party. The trial opened by the Ogboni orator coming forward in a slow and dignified manner, saluting with the most rigid observance of the recognised code of procedure the various parties on the scene, and then in a quiet, deliberate speech announcing the error the war chiefs had made, and requesting them to say what they now proposed to do. As he retired to his company the war chiefs whispered their reply to their representative, and in the same cool, quiet manner he stepped forward, saluted, requested fuller explanation, and retired. In this way two hours were occupied. I was then requested to make my statement, after which there was another exercise of oratorical and diplomatic speech, followed by my acquittal and the restoration of three of my men who were carried off on the day of the attack and kept in close and cruel confinement. The durbar at which the Lagos Governor was present a few weeks since was doubtless on this identical spot. The chief Mogaje, or Ogudeyi Mogaji, who presided at this interview lives in the immediate neighbourhood.

This visit of His Excellency is of great importance. There is every reason to believe that the frequent and harassing interference with the freedom of the roads by which the merchants and traders have been so wantonly annoyed will now cease, and

this country, together with the still more important region of Yoruba beyond, will now become as safe as any civilised land, and be favoured with a prosperity which its wonderful fertility only needs the assurance of peace to develop.

MARKET WOMEN.

Leaving Abeokuta, through a market where the good-natured women salute you with the friendly "a-re-wa"—"go and return"—we passed towards the Yoruba town of Eruwa.

ENTRANCE TO ERUWA.

We now reach a highly romantic and picturesque portion of the country. In entering the town by the Iberekodu gate one has almost to squeeze through the narrow opening between huge rocks. Eruwa is a wonderful little town perched like an eagle's eyrie among a mass of high bare blocks of granite, with sundry little patches of garden frequently interspersed. On the north side is a high face of steep rock, with here and there a tree growing from a crevice. This rock cannot be less than 300 feet in height.

CORN HOUSES.

The rocky character of this town presents many groupings of a most picturesque character. Little houses perched on the rocks are used for storing corn. The human habitations are not much more commodious.

AKOLU.

The Akolu is a singular looking rock, and dedicated to a remarkable use. It is an object on which the king is forbidden to look. In the day he looks thereon he is to die. Should, therefore, the king so commit himself as to merit the death penalty, he is blindfolded, and led up to this rock, where the bandage is removed. Standing in front of the fatal stone, with his eyes uncovered, that fact alone seals his fate, when he is led back again, and soon dispatched to join his fathers in the world beyond.

After leaving Eruwa the scenery culminates in views of wild grandeur, changing almost with kaleidoscopic frequency at every few yards of the road—here a weird gorge in a gloomy ravine, there a huge fantastic mass of granite rocks towering up with sharp definition against the molten sky, while rugged outlines of hill ranges bound the horizon 30 miles away.

MOUNT OKÉ ADO.

Oké Ado is a remarkable object which thrusts itself into view for hours before it is reached. The height from the plain according to my aneroid is about 700 feet. The length of this Kopje is about one mile and a half. The sides are inaccessible except

in one place, and even there a portion of the climb has to be performed on all fours. On the summit are two little villages, the remotest being regarded with great veneration as the home of the Ifa deity.

ESÉ ADO.

At the base of this hill on the west is the little town of Esé Ado, and from a spur of the hill, 400 feet above, we secured a fine photograph. From here you have a bird's-eye view which gives a good idea of the arrangement of a Yoruba town and the formation of their compounds, a series of rooms covered with high roofs carried around the four sides of a square, with an open yard in the centre.

Proceeding northwards, threading our way around the hilly region, with extensive views of country bordering on Dahomey and apparently 50 or 60 miles distant, the road leads through an open region, only very partially cultivated. One pretty little village is passed through, but, with the exception of two or three solitary farm sheds, no other human habitations are met until the town of Iseyin is reached, with its affable and hospitable chief.

THE ASEYIN.

This dignitary, like the chief of Eruwa, is often styled king. He is, however, subordinate to the great chief of Oyo, the Yoruba capital. The Aseyin clothes himself in regal attire, and has symbols of authority at his feet when receiving strangers.

On being conducted into his presence, he was found surrounded by a number of swarthy ladies, who rejoiced in watching for opportunities to wait on the wants of their many-partnered spouse. At his left, a band of musicians offered frequent interruption by their vocal and instrumental exuberance of noisy welcome. Now and then there was an utter abandon of mirth and generous greeting, after which a minstrel would chant an impromptu song. This is one sung during one of my visits—

There is no king like the Iseyin,
No one so strong, so kind and true,
A friend of the white man from over the sea,
The father whom all his people love.

During an interval of comparative silence, the king beamed on me, saying, "I knew you were coming. I dreamt it three nights ago!"

ISEYIN—OYO GATE.

Oyo Gate is a good representation of the method by which the towns are defended against invasion. A deep ditch, the wall with its battlemented edge, a tree trunk which communicates with the outer gate, and the thatched roofs behind the two men mark the position of the court where customs are levied, and strangers obtain permission to enter. Within the

first or outer gate is an enclosure, on one or both sides of which the tolltakers reside. Their business is to scrutinise all who seek to enter the town, and receive—well, as much as they can get. Often the negotiation is very vexatious. The most unaccountable pretexts are invented to rob the traveller. Not only tolls but fines are sometimes imposed in the most arbitrary way. The crowing of a cock, the wearing of shoes, and all sorts of reasons are invented on the spur of the moment to demand an additional tax. I must say, however, that it is not the Yoruba but the Ijebu who excels in the tax-demanding vocation.

RIVER ODO OGUN.

From Esé Ado, to Iseyin, Oyo, and Ogbomosho, there are no tall forest trees, but frequent patches of bare rock, and several areas covered with short, crooked branched thorny trees. One is sometimes reminded of an oak coppice, or a scrubby orchard. Now and then a charming vista opens out showing clumps of trees and several rounded hills surrounded by grass-covered plains.

Between Iseyin and Oyo, in the vicinity of this river, is a quantity of iron ore, which is smelted on the spot. The furnaces are pits about 10 or 12 feet deep, at the bottom of which are placed layers of charcoal and ore. Clay tubes, about 12 or 15 inches in length and an inch in diameter, are thrust into the mass, and the process results in the production of iron of a very fair quality. I regret to be unable to give a more detailed account of this industry, but no class of artisans guard their trade secrets more jealously. The locality at which we were now halting has many charming bits of scenery. We found at this spot a ferry, where a remarkable method of crossing is practised. Two halves of large calabashes are evenly cut and strongly glued together to form a flattened spheroid. The passenger sits on this, while the ferryman swims behind and pushes his fare before him.

ANT HILL.

Here and almost everywhere in West Africa one is constantly reminded of the number and variety of the agencies which ceaselessly renew the fertility of the soil. From the worm which covers the ground with little cylindrical casts of two or three inches long, to the castle of the termite, 10, 12, and even more feet high, the sub-soil is being brought up from several feet below the surface to renew the face of the earth. I usually prefer to call large ant hills castles—"castles," a designation which their immense size, complicated and mysterious passages, and turretted summits very naturally suggest. One of the "castles" found here was about ten feet high, a man standing in front of it, a tall, six-foot negro, will only cover three-fourths of the height. And this is by no means the maximum height

to which they are often carried, while their diameter is only slightly less. A hill 10 feet high and 25 feet in circumference, one-half of its contents composed of clay walls, while the rest consists of labyrinthine ways, cannot weigh less than five tons—an astounding calculation when we bear in mind that all this immense pile, with its curious architecture, is the work of little blind insects not half an inch long. I have assisted at the destruction of several of these so-called “ant hills,” and never without being astonished at the marvellous instinct and toil involved in their construction, the social orders into which the community is divided and the methodical routine in which each fulfils his own proper duty.

THE QUEEN TERMITE.

The most important individual in the castle is the queen. Several feet underground is the royal chamber, a crescent-roofed apartment with only one small aperture. By some mysterious process the ant selected to be the queen attains a marvellous size, nearly filling the space appointed for her use. The creature is not a beautiful object to behold. Her head is no larger than those of her subjects, but the body attached to it becomes, to quote Professor Drummond, “a large, loathsome, cylindrical package, two or three inches long, in shape like a sausage, and as white as a bolster.”

In connection with the earth worms and termites, a curious and interesting statement was made to me by a very intelligent and observant native in regard to the guinea worm. Popular ideas among Europeans connect the presence of this worm in the human body with drinking water. My friend assured me it was NOT so. The worm is invariably found in some portion of the body which has come in contact with the ground. I possess a specimen which was taken about eight feet under the surface from a pit out of which we were getting clay for building our house at Oyo.

But we must hasten forward.

THE ALAFIN'S PALACE, OYO.

The road from Iseyin to Oyo is almost due east, and takes a full day to cover. On entering the town, which is the metropolis of Yoruba, from the Iseyin road a good view is obtained, as the town lies on a gentle slope below. As a matter of course several visits were required to the authorities, one of the most important of which was to the king, or, as he is called in Yoruba, Alafin. The palace is built around the sides of a large quadrangle, which it thus encloses. The view of the interior of the quadrangle shows at one side some singular-looking projections called kobis or porches, which are absolutely forbidden to be erected to any other than royal residences.

THE ALAFIN, OR YORUBA KING.

The Yoruba kingdom at one time covered an immensely larger area than that enclosed within its present boundaries. A tradition exists that this race is a survival of the family of NIMROD, which migrated westward by the exigencies of multiplying population, and the restlessness of a nature characterised by a love of the chase. But in the absence of historical records their origin must remain obscure. The present king seems a man of more than average intelligence, and treated us with consideration and generosity. He is always attended by Syero, his confidential secretary. When visitors are admitted to an audience, communications from and to the king are usually made through Syero. Between the king and Syero the conversation is a whispered one.

Oyo is a great trading centre, and the markets are always scenes of bustle. Scores of dealers squat in the shade, crying out the virtues of their wares—cloth, beads, indigo, ironware, pottery, calabashes, ornaments, fetishes, and a variety of other supplies for the needs of a large population. Hundreds saunter to and fro or repose beneath the trees. Among the crowd are proud Moslems in turban and robe, merchants from far off Sokoto, and slaves trailing along in single file bearing heavy burdens on their heads. On one side are weavers throwing their shuttles, and on another side calabash carvers dexterously using their knives. Women pounding corn for food and preparing indigo for the dye pots, and blacksmiths striking on their anvils with merry noise, all contribute to the bustle of the scene; while measly dogs and carrion buzzards, the unpaid scavengers of the town, diligently fulfil their indispensable vocation.

THE HEIR-APPARENT, KOFOWOROLA.

One of the most courteous and intelligent Yorubas I ever met is Kofoworola, the heir-apparent. Some years ago I gave him a large coloured picture of Her Majesty, Queen Victoria. From a letter of a missionary just received I learn that the picture still occupies a place of honour in his house, and is regarded with profound respect.

A SNAKE CHARMER.

As a white man in a country where white men are scarce, I was an object of much interest, and was honoured with many visits of curious but courteous callers. One of my visitors, a woman, allowed me to obtain a photograph of her. She was a snake charmer, and performed several clever tricks with her pet, singing all the time a song which celebrated its marvellous qualities, and concluding the performance by tying the reptile

around her neck, and it was in this attitude that I took her photograph.

SHIKARI DANCERS.

These men are invested with the responsible and delicate prerogative of telling the king his faults. They are also retained to honour strangers with songs of welcome. For these duties they are supplied with large bottle-necked calabashes, having a number of cowries plaited together and loosely fastened round. The shikari is thrown from one hand to the other, and the cowries striking the empty gourd make a rhythmic accompaniment to an improvised song. This was their greeting to me—

We salute the white man,
Who came from the sea;
The Good white man,
We would follow to the sea.
The white man is welcome,
For the white man we love,
Who came from the sea.

RUSTIC BRIDGE.

Journeying in a north-easterly direction we then go to Ogbomosho. The distance of 20 or 25 miles is through a region without a single village. A few farm buildings only are found. One rather deep ravine had to be passed, over which some large trees had been made to fall. Small sticks, laid transversely on these girders, and plastered with clay, formed a path. This bridge was the most ambitious engineering feat yet witnessed; but, alas! it was unsafe, and the gully had to be passed in the primitive style.

OGBOMOSHO—BALÉ'S RESIDENCE.

The Balé or chief resides within this building, and I was somewhat surprised at the attainment to which the arts of wood-carving and other evidences of artistic design had reached. A preliminary message of courtesy had been sent, accompanied by small gifts and great respects. Entering by a doorway close by some curious images, a demonstrative greeting with trumpets, horns, drums, and excited shouts was given. The interview was frequently interrupted by a most officious trumpeter, who, after a shrill blast on his instrument, would bawl forth praise to his master and welcome to the guests.

HEADS IN MARKET.

The chief market is held in front of the Balé's place, to which a visit was made for the purpose of photographing a tree against which some criminals' heads had been nailed.

The next ceremonial function required by the courtesies of the country was a visit to the Onpetu's. While waiting to be announced a brief halt was made near the fetish enclosure at the foot of a large bombax tree.

ONPETU.

The Onpetu was king of a country destroyed by war. He is now a refugee, befriended by the Balé of Ogbomosho. But, although he stands in the relation of a protected alien, he still maintains his title, which is superior to that of his protector. The situation, therefore, is one of extreme delicacy, and needs most adroit and careful management. But the Yorubas are skilled in diplomacy.

A NATIVE INDUSTRY.

Two of the principal industries of the country are weaving and dyeing. A firm of weavers use a shed, and underneath are a set of looms. One line of warp is easily recognised. The cloth on being woven is dyed with indigo, a decoction being prepared in large clay pots. The cloth, after having been sufficiently soaked, is kneaded on a board resting against the tree, to get rid of the superfluous water, and afterwards hung up to dry.

INTERVIEWS.

On my second visit to this town I found that opposition had been manifested to the mission by the heathen, one of whom naively observed, "It would spoil his fetish." I took a picture of the objecting priest, in the piazza of the house, with some of his people, while a huge crowd filled all the other rooms and the surrounding yard. The following conversation took place:—

"We don't want you here. You can teach us nothing. We are as wise as you."

I quietly observed, "We might learn something from each other."

"No," was the emphatic rejoinder. "We can do all you can do."

He was then shown a photograph of a well-known Albino of the town, taken a year before, and asked, "Can you do this?"

Displaying a knife with a very ornamental sheath, he retorted, "Can you make anything like this?"

The next move was to point to the camera, and say, "Can you make anything like that?"

"Well," said he, "and what can that thing do?"

One of the carriers, with humour to appreciate the situation, then solemnly explained, "It can catch men!"

"Catch men?"

"Yes, the white man caught the Albino last year and carried him far away over the sea; and look, he has caught you!"

"Catch men! Catch me?"

"Yes."

By this time he was subdued, and displayed great anxiety to escape from the vicinity of this wonderful man-catching instrument.

The picture of the Albino was exhibited, and caused the consternation just described. The Albino explained the object of his visit thus : " I heard that a white man had come, and as one white man ought to salute another, I come to greet you."

IJAI.

Retracing my steps to Oyo, I then proceeded towards the coast by the Ibadan and Ijebu route. The country to Ibadan is well populated and exceedingly fertile. I photographed the gateway of the little town, which survives as the remnant of what was once one of the largest and most powerful towns of the country, but desolated by the ruthless scourge of war. For more than an hour south of the town the traveller threads his way through what were once busy thoroughfares of life and commerce, but are now covered with tangled thorns and briars and grass, with here and there a stump of wall to show where a happy home once stood. The head man of Ijai is a chief of a superior caste, who, in addition to the usual offices of hospitality, entertained me with a band of music and a company of minstrels, who rendered some choice selections from their remarkable repertoire. The following is a translation of one of these improvised melodies :—

Great is the Balé of Ijai;
Great is the Balé's father.
Welcome is the white stranger—
Friend of the Balé of Ijai.

Great is the Balé of Ijai,
Wise and strong is he;
He keeps the town in peace—
Foes tremble at his name.

Great is the Balé of Ijai.
The white man comes from regions far;
The white man stays to salute him—
All men respect the Balé.

Ibadan, the largest of all the Yoruba towns, is about 30 to 35 miles south of Oyo, the capital. The population has been estimated at 200,000. The relations between the two towns have not always been of the most cordial nature. Petty jealousy and love of intrigue keep the people in a state of chronic unrest. I frequently sought to impress on the chiefs the importance of mutual confidence and unity both in the interests of commerce and protection from outside foes. "Your words are true," they would say; "but we are like children fighting. Each is ashamed to be the first to stop, but both wish for nothing better than for *some strong man to step* between us, and send us off to do something wiser."

Here, as in all the other towns of Yoruba, one is impressed with the superior character of the people. I never entered a town or village without receiving the salutation, "Ekuabo, Eku-a-bo"—"You are welcome," from old and young alike, while frequently weavers rattled their shuttles and smiths made their anvils ring with merry noise in the heartiness of their greeting.

FOREST.

Soon after leaving Ibadan the forest belt is entered, and huge trees with their high intersecting branches and delicate foliage furnish suggestions of the source from which Gothic temples took their form.

FOREST CAMP.

Travelling through forests is not always safe. Robber bands prowl in these solitudes, and wayfarers are sometimes plundered and occasionally killed. Hence it is usual for persons who are journeying to wait at a frontier village until a sufficient number have gathered to afford mutual protection. On one of my journeys about 200 people joined my party, and spent a night in the forest. The scene at night was deeply interesting. A space had been cleared of trees for the accommodation of travellers, and occupied by a number of low grass-roofed sheds. The caravan was split up into little groups of from 10 to 20 persons. Each group circled round its own camp fire—telling tales, soothing themselves with crooning chants, perpetrating innocent jokes, and watching with keen interest the savoury supper which was being carefully cooked. Above, the crescent moon was shining, and its silver light filtered tremulously through the surrounding foliage, while occasionally sounds of some animal or night bird added to the weird-like influences of the place.

IJBEBU CORNFIELDS.

Two days' journey from Ibadan through a kind of no-man's land, suffices to reach Ijebu, in which country we had a short but necessary and successful expedition eight or nine months ago. A curious law prevails in this land, which prohibits the use of an umbrella to anyone but the king. The town was entered through a gate guarded by a squat ugly image of wood, not far from which was a tree decorated with some 20 human heads. After waiting two or three hours in a sort of garrison occupied by some 200 naked soldiers, his majesty appeared with his retinue, and a slave holding a huge scarlet umbrella to protect the royal skull.

HALT AT IDOWA.

On one occasion when arriving at this village a violent tornado made it necessary to delay travelling until the next day.

All African journeys are full of interesting incidents, but a repetition of some of them is not always desirable. After a vain attempt to obtain sleep in the apartment to which I was assigned by the chief, I was driven to encounter the risks of the night air by a peculiar and powerful odour which could not be ignored. In the morning my boy accosted me, "You sleep well, sar?" "No," was the reply. With a broad grin the boy continued, "I tink, sar, you get a dead man to sleep with you last

night." "Why do you think so?" Pointing to a rough shelf above the bed, on which lay a long bundle wrapped in mats, he answered, "Look um, sar; he live on dat shelf?" It was too true. The dead man "lived" that night with the missionary. Further inquiry elicited the uncomfortable fact that the corpse was laid there some three weeks before. The custom of the land requires an expensive ceremonial on the occasion of an interment, and often bodies remain for a long time unburied, either on account of the poverty or the niggardliness of the bereaved.

ITOIKÉ.

We have now reached the end of the tramp. Close by the fetish enclosure of Itoiké is the place of embarkation from which the traveller is conveyed six miles down between the charming banks of the River Ódo Ona, and from thence 25 miles down the lagoon to Lagos from which we started.

In summing up the qualities of the people, through whose lands we have been journeying, we cannot characterise them as a highly intellectual race. They have invented no written language nor even an alphabetic sign. Having attained to a certain stage of intellectual and industrial development, there they would be content to remain but for the ambition to reach something higher by which the white man's energy and accomplishments are slowly but surely inoculating them. It may not be out of place for me to say that the only people whose progress rises in an un-arrested flow are those of the Christian nations, while all beside having reached the highest level to which their tide could raise them, remain immoveably stranded on their high-water mark, or are falling back again with the ebbing wave.

I have scarcely hinted at the industries and customs of the people, the fertility and products of the soil, the climate and meteorology, and several other subjects on which one is strongly tempted to dilate. Corn, yams, indigo, beans, fruit, shea-butter, cotton, palm nuts, iron ore, clay, I have left almost untouched in all their luxuriance—the farmer, weaver, potter, smith, cala-bash carver, boatmaker, smelter, soapmaker, barber, thatcher, builder, cook and confectioner, have all been passed in this ramble through the country almost without a nod of the head—architecture, music, social relationship, institutions, superstitions, natural history, physical features, and much else that one feels to be most important, are only conspicuous by their absence; but I cannot leave Yoruba land without expressing my grateful recollections of its people, the wonderful fertility of the soil, the exceeding salubrity of the climate as compared with the coast, and the fervent wish that the Yorubas and the British may unite in inseparable friendship, and that the friendship may be sanctified with the blessing of the Most High.

TRAVEL AND SPORT IN SOUTH AFRICA.

By F. C. SELOUS.

[Addressed to the Members at the Memorial Hall, Saturday, March 4th, 1893,
at 7-30 p.m.]

MR. SELOUS began with a brief reference to the change that has taken place in the facilities for communication between Cape Colony and the interior in the twenty-two years that had elapsed since first he began his travels in Africa. At that time there was only one short line of railway connecting Capetown with the village of Wellington. Now, as they all knew, a great change had been effected. Very early in his travels he got to Matabeleland, and there met the great chief Lo Bengula, of whom much has recently been heard. At that time the chief of the Matabele country was a man about 45 years of age. He was strongly built and already becoming very corpulent. His manner of taking his food was striking. The meat was brought to him in an immense trough, with a huge carving knife and fork. He would take the fork, stick it into a large lump of meat, hold it up on the end of the fork and put it in his mouth. The piece that he had in his mouth he would cut off with a carving knife close to his lips. In this manner he would go until he had eaten a great quantity of meat. His visitors had to help themselves out of the trough either with pocket-knives or with their hands. When he told Lo Bengula that he wished to stay in his country for some time to shoot elephants, the chief turned away laughing and said, "Oh, you are only a boy; the elephants will drive you out of the country." However, young though he then was, the elephants did not drive him out of the country, and for three years he kept at the wild life of elephant hunting. He did not at that time do anything in the way of road-making or maps. Some time later, in the Barotse country, he spent some months hunting elephants and other large game, the meat of which the people consumed for food, and he could see that on that account his visit was a very welcome one. It was in the year 1874, and subsequently in 1877, and again in 1879, that he witnessed the very curious phenomenon of the rising of the waters of the Chebe during the dry season. In 1879 particularly he took notice of the rise, and found that the water rose gradually from May to the 23rd of September, and as during that time the weather was getting hotter day by day and no rain was falling, he could not understand the cause of the phenomenon, for during all that time all

the other rivers of South Africa kept falling until the rain began again. It naturally occurred to him that possibly the rising was due to the sun melting the snow on the hills from which the river was fed, but on looking into the matter he found that that explanation was not tenable. In 1875 he returned to England, but very soon got tired of English life, and a few months later he returned to South Africa and at once made his way into the interior. In the compass of an hour's lecture it was impossible to give a detailed account of all his travels, so he would pass over several of his journeys and proceed to tell something about Mashonaland. It was in 1878 that he first travelled over the high open downs on which the town of Salisbury now stands, and between that time and the latter end of last year he spent ten years of his life in that country. During those ten years he travelled over every portion of the Mashona plateau, and besides made several journeys into the Zambesi Valley and also to the east coast. He mapped out the country in a rough way by taking compass bearings, and by sketching from the hill tops the courses of the innumerable rivers and streams. On one of his hunting expeditions in Mashonaland in the year 1880 he had for companion Mr. J. S. Jameson, who recently lost his life under very sad circumstances when left behind on the Congo during the progress of the Emin Relief Expedition. During that year he traced the course of the Umfuli River to its junction with the Sanyati, proving conclusively that it did not run into the Zambesi independently, as represented on all the maps published up to that date. They might like him to give them a few particulars with regard to the present state of Mashonaland. Until the time when the British flag was planted at Salisbury on 11th September, 1890, Mashonaland was an almost uninhabited country, unknown perhaps even in name to the great majority of Englishmen. Since that time a great and wonderful change had taken place. Townships had sprung up, not on paper as many people would wish them to believe, but in actual fact, as many good substantial brick buildings had been put up not only by the Chartered Company, but by private citizens; roads had been made through the country. For more than a year Salisbury had been connected with the rest of the world by telegraph, and in two of the townships well-printed weekly papers were now published. He wished he could have brought one or two copies of the papers to show them, because these would have given them a better idea of the development of the country than almost anything else. In spite of anything that had been said by interested or disappointed people, there could be no doubt that there had been a steady development of Mashonaland ever since the first occupation of the country, and he felt certain that the foundations had been laid for a rich and prosperous British colony. From what he had read and from

what he knew, he would say that the climate of Mashonaland was one of the finest in the world. On the high plateau there was not such a thing as a warm night the whole year round. In the winter time the nights were bitterly cold. The absence of heat was no doubt due to the great altitude of the country, for the whole plateau was very high, rising in some places to a height of 5,000ft. to 6,000ft. above sea level; but it was also due to some extent to the fact that it was the highest land in South-eastern Africa, and therefore caught the cool winds that blew from the Indian Ocean. It was never as hot on the plateau in Mashonaland as it was in Kimberly or Pretoria, or even in Capetown, although all those places were much lower in altitude than Mashonaland. As regards the health of the country, of course, as in all new countries within the tropical area, there was a certain amount of fever in the rainy season; but experience had shown that fever was mainly due to exposure under unhealthy conditions. He called it an unhealthy condition to lie out all night with your head in a gutter in a rainy night, and that was a condition often met with in Mashonaland. Of course he was far from saying that all who contracted fever did so through their own fault. But in a new country, as they must understand, a man must be much exposed. If he was energetic he travelled about the country, and with the rain falling and the rivers full he was likely to suffer from exposure, and thus he would catch fever. But the experience obtained at Salisbury had shown that with more comfort there was very little fever indeed. During the first season in Salisbury, when the people were living in small huts, they suffered more or less from fever; but last year, right through the rainy season, nine people out of ten escaped the fever. The very few women there were in the country enjoyed excellent health. Mrs. Pascoe, the wife of Major Pascoe, of the Salvation Army, told him that she and her four children looked as healthy as children possibly could. In Matabeleland, which lay in the same climatic conditions, he had seen some strong, healthy families grow up. He thought there was no doubt whatever that Mashonaland was a country in which Europeans would retain their vigour and grow up a strong and healthy race, and of course it must be a country of that kind to become a British colony. Of course the development of Mashonaland depended to a great extent on the rapid development of the gold industry. He did not pretend himself to know much about gold, but he felt sure that it was an absolutely proved fact that the gold reefs of Mashonaland were very rich. The last paragraph of a letter he had received from Dr. Jamieson, the able administrator of the country, read thus: "Gold exceeding all our expectations, and we are going to go all right." Such a sentence from a man like Dr. Jamieson meant a great deal, as

it did not express a hastily formed opinion, but a conclusion arrived at after two years of observation. Dr. Jamieson was not at all of a sanguine temperament; he was a very shrewd, long-headed Scotchman. With regard to his travels in South Africa generally, Mr. Selous said that he had visited many places that had never been visited by a European, and he had seen many strange peoples, including some who wore no clothing at all except a quill stuck through the ear. He had never had any armed force with him at all, and usually travelled with a few unarmed followers, from five to ten in number. He had nearly always been in the power of the natives, who might have murdered him with the greatest ease. Yet he never received any ill-treatment at their hands, and, with the exception of having to resist a little petty extortion, he had never had any difficulty with them. This referred to the whole of his twenty years' travelling in South Africa, with the exception of one particular occasion. The occasion referred to was in 1888, when in the dead of the night an attack was made on his camp by the Mashukulumbwe, who were incited to the attack by some rebel Barotse. He concluded his lecture with a thrilling description of the attack, of his escape without his rifle and almost without clothing, his swim across the river, the assistance given to him by the Barotse rebel chief Sikabenga, and his ultimate safe return, after enduring great hardship, to his waggon at Panda-ma-tenka.

A Railroad to Nowhere.—There is a railroad in Manitoba that starts from Winnipeg, runs forty miles north—or, rather, it stays, for it doesn't run—and goes to seed, on the prairie. The rails are rusty, and the ties are grass-grown. When they began to build that road the objective point was Hudson Bay, but it looks as if it would never get there. Readers may recall the project for shipping wheat from Dakota, Manitoba, and Assiniboia to England, by way of Hudson Bay, the grain to be carried overland to Fort York, at the mouth of the Nelson, there to be transferred to steamers and sent eastward over the bay, through Hudson Strait, and across the Atlantic. One of the most prominent railroad men in Canada, who was here a few days ago, and who, in case of its extension, will have a good deal to say about its management, spoke to this effect: "I presume the road will be built; they wouldn't have laid forty miles of rails for nothing; but I don't take much stock in the Hudson Bay part of it. I can tell you for a fact that it will be pushed for about two hundred and thirty miles—as far as the rapids of the Saskatchewan, just above where that river empties into Lake Winnipeg, for, between here and there, it is mostly good grain country, and the road will help to build it up; but beyond the Saskatchewan it is a wilderness, with poor soil, and the frost stays in the ground most of the year. The scheme for navigating Hudson Bay is one of the wildest ever projected, and if the people in it knew what they were talking about they would have dropped it long ago. The St. Lawrence is far north enough to start ocean steamers from. To go through Hudson Strait, ships reach 63° north—about the latitude of Lichtenfels, in Greenland. Beside the short summers and the floating ice, there is an insurmountable obstacle to navigation in the wide compass variations, making it necessary to sail by sun and stars, at least in iron ships. And where are you in a fog? The magnetic needle shifts 60° in going from one side of the bay to the other, and it has a dip of 40° out of the horizontal."—*Goldthwaite's Geographical Magazine, March-April, 1893.*

HINTS ON RECONNAISSANCE MAPPING FOR EXPLORERS IN UNSURVEYED COUNTRIES.

[Read to the Members in the Library, Tuesday, February 14th, 1893, at 7-30 p.m.,
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DURING the last few years so much has been done in the way of exploration, both in Africa and in Asia, that it may be safely said that there is now no large portion of either continent regarding the configuration of which we have not some information.

Travellers in Africa, and still more in Asia, can no longer hope to explore thousands of miles of country never before visited by the white man, nor to discover huge mountain ranges or gigantic lake systems hitherto unknown. There still remains, however, plenty of room for geographical, or, perhaps, to speak more correctly, for topographical enterprise.

Although we now possess a knowledge of the main features of the unsurveyed portions of the globe, sufficient work remains, in the way of filling in detail, to occupy the energies of our explorers for many years to come.

Owing partly to ignorance of the compiler's wants, and partly to a want of appreciation of the manner in which our improved knowledge of geography has affected the class of mapping required, the sketches brought back by explorers are often disappointing. It has been found that, in very many cases, work over which the very greatest possible pains have evidently been taken, is robbed of half or more than half of its value, owing to the traveller having neglected some precaution which would have added little, if at all, to his labour. It is thought, therefore, that a few hints, most of them suggested by actual cases, may prove of use to intending explorers, and tend to ensure their work attaining its full value.

SCALE TO BE ADOPTED.

I. Intending travellers are often at a loss what scale to adopt, so a few remarks on the subject may not be out of place.

The size of the scale is, of course, affected by the object in view, but there are some considerations that apply generally to all cases.

The rapidity with which a traveller moves, and the amount of time that he can afford to devote to topography, place a limit to the amount of detail that he can hope to map. The proper scale for him to use, then, is the smallest that will permit of his showing that amount of detail.

The advantage of using the smallest possible scale is that the explorer is thereby enabled to sketch more widely on each side of his route, and the larger the area that he has on one sheet of paper, the easier it will be for him to grasp the configuration of the country.

On the other hand, there are cases, for instance, when the traveller moves along the winding bed of a river enclosed between steep hills, or through thick bush in which it is difficult to plot on a small scale the necessarily very short bearings. In such cases it is advisable to plot the route on a conveniently large scale, and transfer it by reduction to the general map.

As a general rule, for sketches not of a purely military character, it may be said that $\frac{1}{4}$ or $\frac{1}{2}$ inch to a mile is the largest that the traveller is likely to be able to work up to (except in the cases mentioned above), while $\frac{1}{8}$ or $\frac{1}{16}$ inch to a mile will be more suitable for any one who is not devoting his time exclusively to topography.

On the latter scales a large extent of country can be embraced in one sheet, while the smallness of the area of paper covered by the traveller's route, and what he can see from it, has a wholesome effect in urging him to make excursions on either side.

It may be said, therefore, that the outside limits between which travellers should select the scale of their general map, are $\frac{1}{2}$ to $\frac{1}{10}$ inch to a mile.

STARTING AND CLOSING POINTS.

II. On receipt of any new work, the compiler begins by locating it.

The work should, therefore, commence from some well known and, if possible, well fixed place shown on some published map. The actual starting point should be described in the report or delineated on the sketch in such a manner, with reference to the surrounding objects, that there may be no difficulty in recognising it on the published map or on the ground.

It is essential that the route should be continuous, and that it should close either on itself, or on some point that has been well and independently fixed.

In closing, the same accuracy of description is required as at starting.

INFORMATION AS TO THE METHOD EMPLOYED AND CIRCUMSTANCES UNDER WHICH THE WORK HAS BEEN EXECUTED TO BE ALWAYS FURNISHED.

III. As the compiler has to fit together routes executed by different men under different circumstances, but all alike in the one respect that they have been mapped under conditions precluding absolute accuracy, it is of the greatest importance to him to have the fullest information as to how the work has been done, in order that he may weigh the evidence properly.

The explorer should, therefore, attach to his map a clear statement as to the following points:—

1. How he has measured his distances; if he has used a base line, he should indicate the position, and state the length and how it was measured.
2. How he took his directions; if a compass was used, and what sort of compass it was.

It would also be an advantage if the traveller would occasionally take observations for the variation of the compass. By doing this, he will discover if his bearings are being affected by any local magnetic attraction.

Should he take such observations, he should state where and how they were taken, and with what result.

3. If he has reason to think that the compass needle may have been deflected by local magnetic attraction during any portion of his route, he should state the limits of such possibly disturbed areas.
4. He should also give information as to any portions of his route that differ from the rest in having been mapped with more or with less care or under more favourable or less favourable circumstances.

USE OF PUBLISHED MAPS BY EXPLORERS.

IV. It is not uncommon for explorers to take a published map and to fill in from their own observations portions of it that have been left blank or that have been incorrectly shown.

In such a case the explorer should state clearly what map has been used, and what points on it have been assumed to be correct.

As it is the compiler's business to study the evolution of maps, he may possibly know that some or all these points are not so well fixed as the explorer supposes, or he may afterwards receive information of undoubted value, which alters the positions assigned to some of them.

In view of such a contingency, it is very necessary that the explorer should state whether his work fitted correctly into the points as shown in the map used or not. If it did not fit, and if he has altered it to make it fit, he should state what alterations he has made, and how the route would have worked out if it had not been altered. Cases have been known where explorers have distorted their really accurate work, under the impression that they were improving it.

Where, on the other hand, the explorer finds reason to alter hitherto accepted ideas as to the configuration of the ground, he should state clearly that he considers his delineation more nearly correct than the old version.

Where he is at all doubtful as to the truth, but inclined to prefer his own work, he should explain how he would adjust it to the old, should adjustment prove necessary.

ASTRONOMICAL OBSERVATIONS.

V. The places where astronomical observations are taken should be carefully marked on the sketch, and a description should be given sufficiently detailed to enable any subsequent visitor to identify the spot within very narrow limits.

It is not uncommon to see observations for latitude taken over and over again with the greatest possible industry, so as to obtain a value within very few hundred feet of the truth, while the place of observation is described so loosely, with regard to surrounding objects, that the door is opened to an error to be measured in miles. These remarks apply particularly to cases where no map is made on the ground, and only notes taken to be afterwards used for the compilation of the route. Many of the important towns in unsurveyed countries are ill-defined, straggling places that extend over a considerable area, and are surrounded by outlying villages and gardens. Now, suppose one traveller pitches his camp in a garden to the north of the town, observes a latitude, and gives his result as the latitude of the town, while another traveller does the same south of the town, it is obvious that the two values will differ considerably.

As a matter of fact, in some cases the latitudes given for the same place by competent observers have been found to differ by as much as two to three miles. The explanation is, of course, simple—the observations were no doubt taken at different places; but, all the same, the compiler is at a loss which to adopt.

If, however, each traveller were to state how far and on what bearing his place of observation lay from the centre of the town, or, better still, from the most conspicuous object in the town, the position of which with regard to the town should be described, the discrepancy would be at once cleared up, and the observations of both travellers would be strictly comparable.

It is essential that all the original observations should be carefully recorded in ink and sent home to the compiler, so that he may check the working and form a sound opinion as to their reliability.

IMPORTANCE OF IDENTIFYING AND FIXING PLACES VISITED BY FORMER TRAVELLERS.

VI. Travellers should remember that a well-executed route reconnaissance is valuable not only for itself, but also for the light it throws on the work of previous explorers, and for the use that can be made of it as an anchorage on which to tie the work of subsequent explorers. They should, therefore, take every opportunity of cutting routes that have been previously traversed, and of fixing on their sketch points that have been shown already on other travellers' routes.

The difficulty that they will experience in recognising the routes of other travellers will teach them better than anything else the precautions they should take to render their own route easy of identification.

THE IMPORTANCE OF SKETCHING AS BROAD AN AREA AS POSSIBLE.

VII. The various methods of mapping ground are treated so fully in many handbooks, that it is necessary here to touch on only one or two points that have a special bearing on the case, or that have not received adequate attention.

It has been stated above that our improved geographical knowledge has caused a change in the class of mapping required.

Not very long ago, any information brought back by an African explorer was compiled into very small scale maps. If the work was to be put to such use it was obviously unnecessary for the explorer to expend his time in mapping details which could not be shown on the scale. All that he required to do was to show the positions of important places, and to delineate generally the larger physical features that he came across. Now, however, an explorer's route in the same country would, perhaps, be compiled into a map of 20 miles, or, possibly, 8 or 10 miles to the inch. The difference in the class of work required is obvious. What is now wanted is topography, and as much of it as possible. It cannot be insisted on too much that, to meet our requirements, the traveller should sketch in all he can see. Much of it, no doubt, will be more or less incorrect, but it need not necessarily be misleading. If it is properly distinguished from the rest of the work, any one using the map will know the class to which each portion belongs, and estimate its value accordingly.

Further than that, he should sketch or record all the topographical information that he can obtain from the natives.

His topography will then consist of three classes, which being of different values must be drawn in different styles, so as to be clearly distinguished the one from the other.

DIFFERENT CLASSES OF TOPOGRAPHY, AND METHOD OF DISTINGUISHING BETWEEN THEM.

1. What he has actually traversed himself and seen sufficiently well to sketch with tolerable accuracy.

This should be drawn in firm lines, that is to say, streams, roads, and contours or form lines should be shown in continuous lines, as in any ordinary map. If the hills are represented by hachures or stumping, they will naturally be shown in as great detail as possible under the circumstances.

2. What he has seen from a distance.

He knows that this exists, but cannot be sure of its exact position. This should be drawn in dotted lines, with the hills, where they exist, shown in a rough conventional style.

3. What he has obtained from native information.

This should be clearly distinguished from the other work, both by the style of drawing, and by a note on the map, "Obtained from hear-say." Unless the explorer is very careful, there will always be a chance of its being mistaken for the representation of ground that he has himself seen. So much is this the case, that some compilers would prefer to have this information recorded in a report, and not shown on the map at all.

On the other hand, a native guide can often point out the general direction of a place that is not visible at the time, and its approximate position with reference to surrounding objects, which have, perhaps, been located on the explorer's map. It is easier, then, to draw its position on the map than to describe it in words.

Again, the moment a man tries to draw on paper hearsay topography, a host of questions suggest themselves that would probably never have occurred to him if he had contented himself with recording the information in a note-book.

If such topography is drawn in a different colour from the rest of the work, or cut off from it by a chain dotted line, there ought to be little chance of mistake.

In any case a record should be kept of the source from which the information is obtained, and of the traveller's opinion as to its probable accuracy.

While dwelling upon the importance of mapping areas and not mere lines, and of getting in all the country right or left of the route, that time and opportunity permit, it cannot be too strongly impressed upon the explorer that it is absolutely necessary for the proper utilisation of his work and for his reputation as a reliable observer, that this marked distinction should be made between topography of different degrees of accuracy.

While it is most depressing to receive from an explorer a sketch of his absolute track and nothing more, as if he had never looked to his right or his left, it is perhaps more fatal to the interests of geographical knowledge when the traveller's work of all descriptions is beautifully finished up, as if it was all of uniform quality, and that the very best possible. Such a map is one of the compiler's greatest difficulties.

If in the first case he laments a lost opportunity, he knows, at any rate, the value of the little he has got; while in the second case he is tantalised by the possession of an apparent wealth of topographical information, the accuracy of which it is morally impossible for him to gauge. Consequently, he cannot tell what to accept and what to reject. If he is too cautious he may reject valuable information; if he is too trusting he may introduce into his work some gross error.

As an additional precaution against a misunderstanding it is most essential that explorers should always show the actual route they followed, and that they should mark with small circles, or in some other way, all points off the route from which they have taken bearings of any importance.

It would then be always possible for the compiler to form some sort of estimate as to what portions of the ground could have been adequately seen.

IMPORTANCE OF TAKING BEARINGS TO DISTANT POINTS.

VIII. Closely allied to the above considerations is the question of recording bearings to different points. Such bearings afford a most useful means of checking the accuracy of the route and of connecting it to other work where the points have been already fixed. These bearings should be separately recorded in a note-book in ink, with a note to say whether they *have or have not been corrected for the error of the compass*.

The best plan is always to record the magnetic bearings exactly as read, and to state that this has been done.

Even though it may be obvious to the explorer that the direction of his route will not enable him to obtain a second suitable bearing to the distant point, he should not omit to take an observation on that account. Cases have occurred where single bearings taken independently by each of two travellers, from points some 50 or 60 miles apart, have sufficed to fix the position of an important hill with considerable accuracy.

A commanding point, well fixed in the early part of the route, may afford most valuable assistance in checking the work further on.

The difficulty, however, of identifying a peak on a range of mountains from different points of view, is very great, and considerable care and attention is required to turn such a feature to good account.

ALTITUDES.

IX. With regard to altitudes, much the same considerations apply as in the case of the traveller's route. If possible, some place of known height should be selected to start from; the series of observations should be unbroken and should close on some other place of known height.

It is very desirable that the original observations should be sent home to be worked out afresh.

In any case the traveller should explain what datum point he has taken, what height he has assigned to it, and on what authority, what instruments he used, and how he took his observations.

If any heights are entered on the sketch of his route, he should append a note to say whether they denote relative heights or heights above sea level.

IMPORTANCE OF MAPPING THE DRAINAGE SYSTEMS MET WITH.

X. Every effort should be made to delineate the drainage system of the country. Even now it is not unusual to see sketches of routes crossing rivers with nothing to show which way the water flows. Whenever possible, the traveller should state where the rivers rise and where they flow to. If it is impossible for him to work this out himself, he may do much from native information, while any notes he may make as to the width and depth at various seasons will assist the identification.

In many countries rivers have different names at various points of their course, and it occasionally happens that the traveller hits upon a river which he assumes, wrongly, to be some well-known one, and which he, consequently, calls by that name. To guard against confusion of this sort, he should always insert the local native name, and if he identifies it with any other river, he should state his reasons for doing so.

RECORD OF CHARACTER OF COUNTRY.

XI. The traveller would naturally record in his report, when passing through new ground, everything that he could observe as to the nature of the physical features of the country; the extent and character of the forests; particulars about rivers, both at the time of his visit, and at other seasons, etc., etc.

Much of this should be entered on the map, as it is much easier to indicate there the extent and shape of a forest or marsh, than it is to describe the same in a report.

The points of chief importance are enumerated in any work on reconnaissance. In some countries special points have to be noticed, which might not occur to an ordinary traveller.

It is particularly desirable that travellers should note on their maps the boundaries or portions of boundaries that are well determined and those that are only approximately represented. They should also state the name of the paramount chief, if any, to which the tribe is subject.

All boundary negotiations in Africa turn upon this point, and it is always a fruitful source of trouble; boundary lines are sometimes drawn cutting off tributary tribes from their paramount chief, the result being invariably discontent and often bloodshed.

NAMES OF MOUNTAINS AND VILLAGES.

XII. In all countries that do not possess a written language, names are a great difficulty. Even where there is a written language, it is frequently impossible to get one generally accepted name for a mountain, however conspicuous it may be, as it often happens that a peak or range is known by several different names in the different districts around.

It is necessary, therefore, that the traveller should satisfy himself as to whether the important places that he locates are generally known under one name or not, and should state his authority in his report. If he hears of more than one name for a mountain or range of mountains, he should, of course, state both, with the source from which they were obtained.

A difficulty occurs in the nomenclature of villages also, from the fact that they are so often named after the ruling chief, and take, on his death, the name of his

successor. At the same time the villages often have, in addition, another name that does not change with the chief. In such cases it is advisable that the traveller should insert the permanent name with the name of the chief in brackets.

Again, it sometimes happens that even after the death of some peculiarly famous chief, his village continues to be called by his name. Or, on the other hand, a chief may move his residence to a new place, which at once takes on his name.

It also frequently occurs, that owing to intestine wars, towns and villages which were once well-known and have appeared on travellers' routes, are found by later travellers to have been entirely wiped off the face of the earth without leaving a trace of their having existed; others with new names may have sprung up on or near the original sites. The result is that, when two reliable explorers have gone over the same route at a few years interval, it sometimes happens that their itineraries contain hardly a single name in common.

It is obvious, therefore, that no general rule can be given about such names; and the value of the travellers' map or report will much depend on the trouble that he expends in investigating and clearly explaining such points.

All names that occur in the report, or map, should be printed, in at least one place, in block printing, so that there may be no possibility of any mistake occurring in the spelling.

METHOD OF SHOWING THE RELATIVE IMPORTANCE OF DIFFERENT LOCALITIES.

XIII. In drawing fair maps it is customary to employ different type for different classes of names, such as countries, provinces, capitals of countries, large towns and capitals of small provinces, small towns, villages, tribal districts, chiefs' names, native kraals, rivers, wells and springs, mountains and hills, and descriptive names.

Naturally the explorer cannot be expected to print in a different manner each of the above classes of names; but any indications will be of value that he can give, to show to which class each of his names belongs.

In order to ensure the importance of the different localities being shown clearly on the map, it is necessary for the traveller either to print them on his map in letters proportionate to their relative importance, or to give a list of their names in classes of the various degrees of importance. The identification of names and their proper recording in maps would be much facilitated if all travellers would spell them phonetically in accordance with the system promulgated by the R.G.S., and officially adopted by the Government Departments and by the Intelligence Division, War Office.

ANY TRAVELLER CAN DO USEFUL WORK WHETHER HE CAN DRAW OR NOT.

XIV. In conclusion it must be pointed out that much as detailed reconnaissances of large areas are wanted, it by no means follows that useful work cannot be done by any intelligent traveller, who carefully records the distances and general direction of his marches, and all that he can see or learn as to the physical features of the country. Routes, of which the traveller has made no sketch at all, are sometimes, in the absence of other information, made the basis of important negotiations; so that no one need be deterred from contributing to the advancement of geographical knowledge, because he has little confidence in his powers as a draughtsman. But under all circumstances it is essential that the traveller should not trust to his memory, nor to the chance that he will be able to assist in the compilation of his work. Everything should be noted down in such a way that it would be intelligible to a person absolutely ignorant of the country.

It is only by doing this that the explorer can ensure his work obtaining full justice.

REVIEWS.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN
INSTITUTION. REPORT OF THE U.S. NATIONAL MUSEUM. *Wash-
ington: Government Printing Office. 1891.*

THIS Report of 811 pages is one of very great interest, and is most profusely illustrated.

The Report by Mr. Robert Ridgway, on "Humming Birds," with 130 pages of text and illustrations of structure, feathers, nests, and birds, beautifully drawn, is of very great interest.

The Report (with engravings) of Mr. S. R. Koehler, on "White-line Engraving for Relief Printing in the 15th and 16th Centuries," is a valuable report.

The Paper by Mr. Walter Hough, on "The Methods of Fire-making," from the simple "drill" to the "lucifer," with illustrations, is of interest.

Mr. Otis T. Mason has an article, illustrated, on "The Ulu, or Woman's Knife of the Eskimo."

The Department of Geology, by Mr. G. P. Merrill, is illustrated with numerous views of microscopic sections of rock to illustrate the varieties and their geographical distribution.

Major W. Matthews, D.D., LL.D., has a fully illustrated paper on "The Cathie Collection of Indian Paintings."

Mr. J. E. Watkins contributes a paper on "The S.S. Savannah," with a picture of the vessel, portrait of Captain Rogers, her commander, and several other interesting illustrations and a copy of one of the pages of her log.

Mr. T. Wilson contributes a report, fully illustrated, on "The Anthropology at the Paris Exposition of 1889."

There are other reports, with bibliographical lists, &c., and two papers of great interest on "The Ancient Pit-Dwellers of Yezo" and on "The Ainos of Yezo, Japan."

Mr. Wilfred M. Steinthal has very kindly contributed the following remarks on the last paper:—

This paper is ably written, accurate in its details, and profusely illustrated—indeed the matter is so good that it is, like the other valuable papers in the same volume, worthy of appearing in more costly form than that adopted by the Smithsonian Institute. It is impossible to summarise such a paper as the one we are now dealing with, and only a few points will be mentioned, in the hope that they may lead to the study of the article itself. Mr. Hitchcock begins by a short statement as to the geographical position of Yezo, and then mentions and criticises the origin of the name "Aino," and of the race and their relation to the Japanese—"The Aino, in close contact with Japanese civilisation, remains, intellectually and otherwise, as much a savage in culture to-day as he ever could have been. . . ."

We have here a remarkable instance of the close association of two distinct races—one superior and powerful, the other degraded and weak. . . . The Aino has not so much as learned to make a reputable bow and arrow, although in the past he has had to meet the Japanese, who are famous archers, in many battles." . . . Our author sums up the relation of the two races by saying—"The Ainos, being unable to affiliate more closely with the Japanese, remain distinct and apart, and are therefore doomed to extinction from the face of the earth." This being the case renders Mr. Hitchcock's paper all the more valuable, especially when we consider how rapidly Japanese civilisation is advancing. We must confess to a feeling of sadness as we think of the polite hairy man of Northern Japan disappearing from his thatched house for ever.

After a short paragraph upon the population, Mr. Hitchcock turns to the personal appearance of the Ainos, being careful to point out that he speaks of the Yezo Ainos as distinct from all others—"The Ainos are small in stature, although rather larger than the Japanese. They are more strongly built, and doubtless endowed with greater powers of endurance. In colour they are rather brown than yellow, but scarcely darker than the Japanese. On this point, however, it is difficult to speak with confidence, for they do not bathe or wash, and the natural colour of the skin is not often seen. The hair and beard, which are thick and bushy, are allowed to grow to full length, and they are never combed or brushed. Consequently, an Aino at home presents a very uncouth appearance. Nevertheless, it is evident enough that most of them would be fine-looking men if they could be induced to bathe, comb their hair, and put on good clothes. Although ignorant and superstitious, they do not look like savages or barbarians. Their manners are gentle, and their voices soft and pleasing."

The hairiness of the Aino next occupies the writer's attention, and a detailed examination of individual specimens of hairs, taken from different men, occupies some space, and no doubt will be found more interesting to specialists than to the general reader. Then follow descriptions of houses, cooking instruments, &c., all classified, and with clear headlines, making reference easy. In the section dealing with Saké drinking he mentions a chief, who spoke of Miss Bird as the "woman to whom he told so many lies"—an amusing commentary on Miss Bird's "Unbeaten Tracks in Japan."

The extraordinary Bear feast, the great Aino festival, is noticed, and an interesting account of the ceremony, condensed from that of Dr. B. Scheube, is given. To many this part of the article will be the most interesting, giving an insight into primitive religious customs, in clear and temperate language, the charm thereof being none the less for the quaint Japanese illustrations. The paper ends with a series of short stories taken from the works of Prof. Chamberlain and Mr. J. Batchelor, illustrating the folk-lore of this fast-disappearing race. Not the least valuable part of the whole article is a bibliography of the works on the Aino race and country. Mr. Romyn Hitchcock must be congratulated on the valuable and readable paper he has produced.

A Special Political Map of Italy, showing the civil, military, and ecclesiastical divisions and subdivisions of the country, with explanatory text, has been published by the Istituto Cartografico Italiano of Rome. It forms an atlas of 20 sheets, each about 20in. square, drawn to a scale of 1:500,000, and coloured with singular delicacy and good taste. Notwithstanding the apparent limitations of the title, the map is useful for general reference, though it must be remembered that the longitudes are calculated from the meridian of Rome.—*Bulletin of the American Geographical Society*, June 30, 1893.

THE REPORT OF THE SECRETARY TO THE COUNCIL ON THE WORK OF THE SOCIETY FOR THE YEAR 1892.

THE work of the year has been full of interest, and the attendance of the members at the various meetings has shown the interest taken by them in the addresses and papers they have heard.

The communications and exchanges with home and foreign societies have a natural tendency to increase, and the correspondence of the Society with correspondents abroad has been of very great value to many members.

The steady pressure of the Society in the district on the educational side of Geography is beginning to tell, and the Society is to be congratulated in that, by the help of the Royal Geographical Society and the concurrence of the authorities of Owens College, we have at last had a Lectureship on Geography established at the college—the first lecturer being Mr. N. Yule Oldham, M.A., F.R.G.S., who has successfully completed his first year of office.

The work at the Owens College will be of very great advantage in the future, as by it a large number of those who will presently be teachers will for the first time have been shown the right METHOD in relation to the teaching of this science, and the use which can be made of maps, diagrams, lantern slides, &c., and the right use of text-books—making all these to serve in giving interest and point in the lectures, and bringing text-books into proper relationship as servants instead of masters.

An examination of secondary schools in Lancashire, Yorkshire, and Cheshire in the geography of "India" was duly held. The report, with the interesting remarks of the Very Rev. Dr. Casartelli thereon, has been already published. The next examination of primary schools on the geography of Yorkshire has been postponed to the year 1894. During the year a large number of visits have been made to primary schools, and the Visitor found the result to be that, whilst the appliances are in a great number of schools most inefficient and entirely out of date, still a great advance has been made, and the teaching is very often of a very satisfactory kind.

The Visitor was pleased to find a large number of schools beginning to make collections of natural objects and manufactured articles with which to assist the pupils in their lessons; and an examination of a good many classes showed that the pupils were taking interest in the questions, and, without any appearance of "cram," had mastered a fair amount of knowledge.

Unfortunately this does not generally apply to any large number of secondary schools, who are, as a rule, most woefully behind in this subject, and who regard Geography as an entirely subsidiary matter. This will, we hope, be remedied by the action of the Lecturer in Geography at Owens College.

The analysis of foreign and home journals by the Victorians, published in the *Journal*, is a most patient work and has been well done, and has proved of great use to the members of the Society. Since this careful analysis was begun, a large number of other societies have been doing work of a similar character, and, perhaps, in the near

future, a complete and condensed view of international geographical work will be possible, which could not have been until this pioneer work was done.

One of the elements helpful to the spread of geographical knowledge in the district thirty miles round Manchester has been the large number of lectures given by the Victorians to large and appreciative audiences.

This work and the general work of the Victorians is reported in a separate report, and nothing more need be said, except that under the management of the new hon. sec., Mr. J. Howard Reed, work of as interesting and complete a character may be expected in the future as we have had in the past.

At the smaller meetings in the Library an examination of foreign journals and a discussion on short communications have taken place, with great pleasure and benefit to the members who have taken part therein.

The library and the collection of maps is increasing rapidly, and the Council regret they are not able to find a better home for them.

Day by day and week by week these additions are being constantly made, and it is most astonishing that in the short time the Society has been in existence so very splendid a collection has been possible.

We are very largely indebted, indeed, to those who are constantly forwarding treasures to enrich the collection of the Society.

As many numbers of the *Journal* have been published as the finances of the Society have been able to bear; if we had double the number of members the *Journal* could be published up to date (the MS. is all ready), and more illustrations could be given.

We have done what was possible in the matter, and are striving to bring the issues nearer to the date.

The Society has been favoured with a large number (52) of addresses and papers, and the following list of titles and authors gives some idea of the importance and interest of the questions raised. They are arranged geographically :—

EUROPE.

A Drive from Manchester to Carlisle. By Mr. J. Barker.

Travel in Western Norway. By Mr. A. Heywood, jun.

An Ascent of the Matterhorn. By Mr. Wm. Lancaster, jun.

The Delegates of the Society at Genoa.

Columbus (see North America).

Deep Sea Explorations in the Mediterranean.

Picturesque Sicily. By Mr. W. Angelo Waddington.

A Visit to Constantinople. By Mr. W. H. Quilliam.

ASIA.

Railways in Palestine. By Major N. C. Conder.

The Turco-Tatars. By Prof. A. Vambéry.

AFRICA.

Morocco.* By Mr. J. E. Budgett Meakin.

The Nansen Association.

The River Volta. By Mr. G. Dobson. With map.

- The Congo : Discovery and Exploration. By Mr. J. Howard Reed.
 The Congo Free State. By Mr. R. C. Philips.
 The Ruins of Zimbabwe Exploration. By Mr. J. T. Bent, F.R.G.S., and Mr. J. Howard Reed.
 The Work of the Jackson Expedition to Uganda. By Mr. E. Gedge.
 Trade Prospects in Uganda and East Central Africa. By Capt. A. J. Mounteney-Jephson.
 Uganda : Its Value to British Trade. By Capt. F. D. Lugard.
 Newala and East Africa. By Rev. W. C. Porter, M.A.
 Taxation in British Central Africa.
 Suakin and District. By Mr. A. B. Wylde.

NORTH AMERICA.

- The Grand Falls, Labrador.
 Canada and the Great North-West. Tables. By Major-General Sir F. de Winton, R.A., K.C.M.G.
 Columbus. By Rev. S. A. Steinthal, F.R.G.S.
 Columbus and Genoa. By the Chevalier Froehlich.
 The Four Voyages of Columbus. By Major Ballantine.
 Chicago and the Exhibition in 1893.

SOUTH AMERICA.

- A Journey to the Gold Regions of Sandia and Carabajo, Southern Peru. By the Chevalier Guillaume.

PACIFIC AND AUSTRALIA.

- The Early Discovery of Australia. Maps. By Mr. E. Delmar Morgan F.R.G.S.
 The Meteorological Work of Mr. Clement Wragge in Queensland.
 The New Standard Chart of Australia and New Zealand. By Mr. Clement Wragge.
 Kanaka Labour. By Mr. W. D. Pitcairn, F.R.G.S.
 Recent Explorations in British New Guinea. By Mr. J. P. Thomson.
 The Hurricane in the Mauritius. By the Very Rev. L. C. Casartelli, M.A., Ph.D.

ARCTIC AND ANTARCTIC.

- The North Pole. By Dr. Fridtjof Nansen.
 Several Papers on Nansen's, Peary's, and the Jackson Expeditions.

SCIENCE ADDRESSES.

- Astronomy in Relation to Geography. By Mr. T. Weir.
 Geology in Relation to Geography. By Prof. W. Boyd Dawkins, M.A., F.R.S.
 Meteorology in Relation to Geography. By Prof. T. H. Core, M.A.
 Zoology, its Relation to Geography. By Mr. W. E. Hoyle, M.A.
 On the Construction of Maps. By Mr. H. T. Crook, C.E.
 Commerce, in Relation to Geography. By the Very Rev. L. C. Casartelli, M.A., Ph.D.

MISCELLANEOUS.

Report on the British Association Meeting at Edinburgh, 1892.

Report of the Secretary on the Work of the Year 1891.

The Report of the Victorians to the Council on their Work, 1891-2.

Report on the Society's Examination on "India," 1892, in Secondary Schools.

Special Report on the Papers Offered in the Examination on India. By the Very Rev.

L. C. Casartelli, M.A., Ph.D.

Financial State of the Society, with Auditors' Report, for the year 1891.

A Geographical Lantern Show at the Children's Party.

The Establishment of a Lecturer in Geography at Owens College.

Class Lecturer in Geography in Manchester, 1741. By Mr. C. Roeder.

The Methods of Missionary Work. By Bishop Smithies.

Scientific Hints to Missionaries. By Rev. L. E. Baynard Klein, D.Sc., F.L.S.

Practical Suggestions to Travellers. By Mr. J. P. Thompson. Maps.

The Teaching of Geography Made More Interesting. By Dr. Ganzenmüller.

How a Lace Curtain is Made—Illustrated. By Mr. John Mortimer.

Reviews, two of them illustrated, have been read and published of the following works :—

Porto di Genova, MDCCCXCI.

La Regularisation des Portes de Fer et des autres cataractes du bas Danube.

The Partition of Africa.

Sultan to Sultan. Illustrated.

My Cousin's Wife.

Health Hints for Central Africa.

British New Guinea.

Voyage of the Nyanza. Illustrated.

The Realm of Nature.

Britannic Confederation.

A large number of the members have taken part in the excursions of the Society.

The idea being that a knowledge of home geography should precede foreign travel, and in foreign travel that every help should be given in every way by concise direction, introduction, and guidance to those members who call upon the Society, it is very gratifying in connexion with this to be able to say that in every case where our members have had introductions to secretaries and officers of foreign societies they have been received with great kindness and cordiality.

Probably when the International Congress meets in London, in 1895, some plan may be evolved giving a kind of universal passport from one Society to another to the various travelling members of the respective societies.

Our members have during the year visited France, Germany, Italy, Norway, the United States, and have been greatly assisted; whilst at home, in parties of twenty to sixty each, visits have been made to Shrewsbury and Chester; to Northwich, the Weaver, and the Manchester Ship Canal on several occasions; to the Preston Dock, Town Hall and Harris Institute, the Bold Venture Quarries at Chatburn and Pendle; to Chatburn, Mytton, Stonehurst, and Salley Abbey; to Crowden, Tintwistle and Longendale; to Alderley Hall and the beautiful birch woods; and to Halton Castle and Runcorn.

At home visits have been made to Belle Vue to examine the splendid collection of animals and birds, unequalled out of London; to Peel Park Museum and Library; to St. Bede's capital Museum of Commercial Geography; to the Royal Botanical

Gardens, to study the fine botanical collection there ; and to several small cloughs or valleys near the city, or in it ; to find in Mere Clough, Oliver Clough, Boggart Hole Clough, and in the Parks, scenes of beauty, quite within an evening's walk, hardly to be expected until they have been found.

In all these various ways the Society has been persistent and active, but the full measure of the work to be done can only be known to the members who take part therein. If a large accession of membership were possible the work could be done more completely, and the departments which at present are not dealt with could have some attention.

The membership continues at about the same number, and that means that a large number of new members have been elected. An average of about thirty members die during the year, and from various causes some members cease to be with us. To keep up the present number means, therefore, constant additions.

This is at least a part of the work each member could assist in. It does not seem too much to ask that every member should try to bring in one new member a year. It is not a great thing to ask the members to do, and is easy of accomplishment. There are large numbers of persons who are only waiting to be asked who would gladly join the Society, and whom the Society would be very glad to receive.

The financial account and the auditor's certificate are herewith appended.

Several interesting events have occurred this year. The first is the gracious permission of H.R.H. the Duke of York, K.G., to allow himself to be elected our President in succession to our late revered President, His Grace the Duke of Devonshire. Another matter—the appointment by the Imperial Institute of this Society as a Local Centre of the Institute—may, in the future, have important results, as from the collections of the Institute we may be able to obtain for exhibition small but complete collections of raw and manufactured products from the various British colonies and dependencies ; and the election of this Society as a Corresponding Society by the Royal Geographical Society, who have conceded to our members the privilege to attend their meetings, to use their library for the purposes of reference, and to obtain copies of their Proceedings at a reduced rate, very materially adds to the value of the membership of this Society.

Several foreign geographical societies have intimated to us their wish to receive any of our members at their meetings, and have indicated that the members of this Society may obtain their publications at a reduced rate.

This is all in the right direction. There can be no reason why all Corresponding Societies should not concede similar privileges. They can hardly be abused, the number of travelling members being limited, but the fact itself will tend to kindliness of feeling and identity of interest in the subjects of study, and so far at least as we are concerned we shall be glad to see members of Foreign and Corresponding Societies taking part in our proceedings.

Trusting the Society may grow and become more efficient, I beg to remain, yours respectfully,

ELI SOWERBUTTS.

REPORT OF THE "VICTORIANS," 1892-3.

LADIES AND GENTLEMEN,—At the commencement of the last winter session, Mr. Chas. W. Grindley found himself compelled to resign the hon. secretaryship of this branch of the Society's organization, owing to his being called by business to reside away from Manchester. The "Victorians" feel that the Society has lost a valuable worker, and they an able and earnest leader. They rejoice, however, that he still considers himself one of themselves, and has, indeed, rendered them valuable assistance during the past winter.

At the unanimous request of his colleagues, the undersigned has taken Mr. Grindley's place, and his appointment has been duly confirmed by the Council of the Society.

The "Victorians" have much pleasure in reporting that the work undertaken by them has been carried on during the past year with considerable success, and to a slight financial advantage of the Society.

The analysis of the British and foreign papers and journals supplied to the Library is being attended to as usual, and will appear in the *Journal* in due course. It is hoped that this work proves of advantage to the members.

The photographic section has done good service, a number of views of the places visited by the Society, as well as groups of the excursionist members themselves, having been produced. Copies of these have been added to the library, and also supplied to members requiring them at a nominal cost. A number of lantern slides have been made for the Society.

A cycling section has been formed; it is hoped that this may prove of special service in connection with the Society's excursion arrangements.

The members themselves are best able to judge of the value of the work connected with the preparation, management and working of the lantern apparatus, the hanging of maps and diagrams, arrangement of curiosities, &c., and other work connected with the Society's meetings, intended to add to the pleasure and comfort of the members.

During the Christmas holidays a juvenile party was held as usual, and was again a great success, some 200 children of the members meeting together in the Cotton Waste Exchange. The "Victorians" feel themselves much indebted to a well-known member for kindly supplying the creature necessities on that occasion, and to the Treasurer for a number of small souvenirs, which were provided by him for distribution to the little folks. They would also gratefully thank a lady member who, at her own expense, provided a Punch and Judy, ventriloquial and conjuring entertainment. This was highly appreciated by the young people and added *éclat* to the whole event. Their thanks are also due to the Chairman, and other members of the Council, as well as to the Secretary, for their presence and valuable aid.

During the year a series of large diagrams have been prepared to illustrate an address on "Village Communities," given by Mr. Crofton.

The past season's lecturing work has been a decided success. About forty meetings in all have been held. Several of them have numbered from 600 to 1,000 people, and all have been enthusiastic. At eleven of these meetings the Society's lantern has been used, while sixteen addresses in all have been illustrated with lime-light views. "Victorian" lecturers have visited Leigh, Oldham, Newcastle-on-Tyne

Heywood, Sale, Burnley, Radcliffe, Didsbury, Withington, Failsworth, Styal, Accrington, Preston, Salford, Chorlton-cum-Hardy, Eccles and St. Annes-on-Sea, in addition to the home district of Manchester.

Three of the meetings have been held under the auspices of the Free Library Committees of Oldham and Salford, both of which institutions the "Victorians" are proud to have been the means of affiliating to this Society; seven, at the request of our members, for the Literary and Scientific Societies of Leigh, Burnley, Accrington, Heywood and St. Annes; eight for the Working-men's Clubs' Association; and the others for various educational, social and charitable organisations with which our members are variously connected.

The "Victorians" have endeavoured to spread correct views of the value of geography from both its scientific and commercial aspect, and they venture to hope that their efforts have not been in vain. They are much indebted to both the Chairman and Secretary for valuable aid in carrying on this branch of their work. They would also tender their thanks to several members of the Council, and others, who have promised to help in this direction in the future if required.

The "Victorians" would much like to extend their usefulness in this direction. They are convinced there is a wide field for valuable work if the members of the Society themselves would use their influence in arranging meetings, and assist the "Victorians" in giving addresses. All can help in the first-named manner, and several speakers can doubtless be found to do good service on the platform if the demand for their services is increased. It should be remembered that this work not only has a great educational influence on the surrounding districts, and adds generally to the usefulness of the Society, but, at the same time, increases the roll of members.

To meet the financial needs of the lecturing work (which is not, of course, carried on without expense) a small charge is made to all societies which avail themselves of "Victorian" aid. Travelling, hire of slides, purchase of lantern gas, carriage and upkeep of lantern, postages, &c., are paid for out of this fund. The postages alone form a considerable item in the expenditure, some 230 letters having been written by the hon. secretary alone in connexion with the past winter's arrangements.

After paying all expenses a small balance is left in hand. The "Victorians" are with pleasure able to hand over the bulk of this to the Society in the following form:—

A—Lantern-slides, bought to illustrate "Victorian" lectures.

B—A donation in cash of £11 10s.

The "Victorians" are pleased to have been able, in a small way, to add to the usefulness of the Society; they have worked for the general good in the past with much delight, and look forward to doing so again in the future with pleasurable anticipations.

J. HOWARD REED, Hon. Secretary.

56, Ducie Grove, Manchester

REVENUE ACCOUNT.

JANUARY 1st, to DECEMBER 31st, 1892.

Dr.

Cr.

EXPENDITURE.		INCOME.	
£	s. d.	£	s. d.
To Expenses of Meetings	183 9 6	By Members' Subscriptions—	
" <i>Journal</i> , April to December, 1891.....	232 7 9	Life	10 10 0
" Rent, Rates, Gas, &c.	50 17 0	Ordinary	523 19 0
" Books, Maps, Binding, &c., for Library.....	21 5 5	Associate	99 4 6
<i>Less</i> Donation, Mr. S. Booth	5 5 0	Affiliated Societies.....	4 4 0
" Sundry Expenses—Stationery, Postage, Tele- grams, Carriage, Wages, Coal, &c.	35 9 0		
" Commission and Expenses for New Members and Collection of Subscriptions	22 10 3	<i>Less</i> Arrears (lost).....	33 1 6
" Geographical Examinations—	107 19 3	Bank Interest.....	
Prizes and Expenses.....	17 15 2		
<i>Less</i> Special Donations.....	8 10 6		
" Balance, as per General Balance Sheet.....	9 4 8		
	5 4 1		
	£605 2 8		£605 2 8
Donations for Geographical Examinations—			
Mr. N. Kolp	1 1 0		
" Counsellor W. T. Rothwell, J.P. ...	1 1 0		
" C. P. Scott, J.P.	1 1 0		
" W. H. Williamson	1 1 0		
" A. Greg, J.P.	1 0 0		
" W. C. Freeman	0 10 6		
" G. Jackson	0 10 6		
" W. Johnson	0 10 6		
" G. C. Haworth, J.P.	0 10 0		
" Counsellor H. H. Mellanby, J.P.	0 10 0		
" F. Radcliffe	0 5 0		
" J. Robertshaw.....	0 5 0		
" J. Snaddon	0 5 0		
	£8 10 6		

GENERAL BALANCE SHEET, DECEMBER 31st, 1892.

Dr.

ASSETS.			LIABILITIES.		
	£	s. d.		£	s. d.
By Arrears of Members' Subscriptions	257	15 6	To Sixteen Life Membership Subscriptions in Reserve.....	168	0 0
" Stock of <i>Journals</i>	73	0 0	" Subscriptions Paid in Advance	22	11 6
" Lantern and Slides Account—			" Geographical Lectureship Fund	55	12 10
Balance from 1891.....	20	0 0	" Sundry Accounts Outstanding	233	12 4
Further Expenditure	7	19 3			
	£27	19 3			
Less received from the "Victorians" ...	11	2 3			
		16			17 0
Amounts Charged on Account of 1893—					
For New Members	10	0 0			
Amounts Owing for Advertisements	15	10 6			
Cash in Hand, General Account—					
In Treasurer's Hands	31	10 0			
Less Owing to Secretary	4	19 9			
		26			10 3
Cash in Bank, Lectureship Account.....		55			12 10
Balance of Deficiency from 1891	29	14 8			
Less Balance of Revenue Account, 1892	5	4 1			
		24			10 7
		£479			16 8

Audited and found correct,

THEODORE GREGORY, F.C.A., }
 WILLIAM ALDRED, F.C.A. }
 HON. AUDITORS.

June 20th, 1893.

LANTERN SLIDE LIST, 1892.

N.B.—All Slides, except those marked *, are square. ($3\frac{1}{2}$ in. \times $3\frac{1}{2}$ in.)

EUROPE.—I.

- 1 Map—England and Wales.
- 2 Booth Hall, Manchester.
- 3 Booth Hall—Group of Members, 1888.
- 4 Eastham—Group of Members, 1888.
- 5 Eastham, Ship Canal View.
- 6 Eastham, Ship Canal View.
- 7 Eastham, Ship Canal View.
- 8 Map—Manchester.
- 9 Swans.
- 10 Cattle.
- 11 Ashworth Valley, Heywood—Group of Members, 1890.

EUROPE.—II.

GREECE.

- 1 Athens—General View of Acropolis.
- 2 Athens—Acropolis.
- 3 Athens—Entrance to Acropolis.
- 4 Athens—Erechtheum.
- 5 Athens—Erechtheum.
- 6 Athens—Temple of Jupiter.
- 7 Athens—Theseum.
- 8 Athens—Observatory.
- 9 Patras—Gulf of Corinth, general view
- 10 Patras—Lighthouse.
- 11 Patras—Shipping in Harbour.
- 12 Patras—View further in Harbour.
- 13 Patras—Old Venetian Castle.
- 14 Patras—Moonlight, looking west.
- 15 Vostizza—View from above Town.
- 16 Vostizza—Principal Street.
- 17 Vostizza—Street Scene.
- 18 Vostizza—Public Well.
- 19 Vostizza—Street Scene.
- 20 Vostizza—Native Costume.
- 21 Vostizza—Scene Outside a Currant Agent's.

GERMANY.

- 22 Bacharach (Rhine) View.

FRANCE.

- 23 Map—Crevasses of the Cevennes.

RUSSIA.

- (24—52 presented by Hermann Woolley, Esq.)
- 24 Caucasus—Devdorak Glacier, near Vladikavkaz.

- 25 Caucasus—Head of Devdorak Glacier.
- 26 Caucasus—View from Gular Saddle, Uruch.
- 27 Caucasus—View from Gular Saddle, Dych-su Peaks in Distance.
- 28 Caucasus—Agashtan Glacier, near Karaul.
- 29 Caucasus—Chirek Valley, from Karaul.
- 30 Caucasus—Looking up Dych-su Gorge, Karaul.
- 31 Caucasus—Search Party, Karaul.
- 32 Caucasus—Dych-tau, from above Karaul.
- 33 Caucasus—Looking up Dych-su Glacier, from above Karaul.
- 34 Caucasus—Ailama (Korildu), from Dych-su Glacier.
- 35 Caucasus—Nuamquam, from Dych-su Glacier.
- 36 Caucasus—Dych-tau (16,900ft.), from Dych-su Glacier.
- 37 Caucasus—Shkara (17,000ft.), from Dych-su Glacier.
- 38 Caucasus—Shkara (17,000ft.), from above Dych-su Glacier.
- 39 Caucasus—Mishirgi Tau (16,400ft.), from above Dych-su Glacier.
- 40 Caucasus—Camp on Bezingi Glacier, 1888.
- 41 Caucasus—Koshtan Tau (17,200ft.), from Bezingi Glacier.
- 42 Caucasus—Kostau Tau (17,200ft.), from above Bezingi Glacier.
- 43 Caucasus—Janga (16,800ft.), from above Bezingi Glacier.
- 44 Caucasus—Kartan Tau (Saddle Peak, 16,500ft.) and Bezingi Glacier.
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(Presented by the Grand Trunk Railway Co.)

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- 70 Cornelius de Judaeis, 1593.
- 71 Wytfliet's South Polar Continent, 1597.
- 72 Australia, from Atlas dedicated to William Duke of Gloucester, 1700.
- 73 Australia—"Complete Manual of Geography," by E. Bowen, 1747.
- 74 Australia—"Atlas Universel," by Robert de Vaugondy, 1757.
- 75 Australia—"Cosmographie Universelle," by Prof. Phillipe, Angers, 1768.
- 76 Australia—by J. Bayley, from "Geographical Magazine," by W. F. Martyn, 1782.

- 77 Australia—from "System of Universal Geography," by G. A. Cooke, 1800.
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- 32 Ruysch's Map of the World, 1507.
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* * So many of the Slides have been returned injured that they will not be lent in the future, except under special arrangements.

NOTICE OF EARLIEST GEOGRAPHICAL CLASS LECTURES IN MANCHESTER.

By Mr. C. ROEDER.

[Read to the Members, December 22nd, 1892, in the Library.]

"Manchester, 27 October, 1741.—*This is to inform the Virtuosi and Lovers of useful Learning*: That a course of Geography will be Taught in this Town in an accurate Manner, by means of an excellent Pair of Globes, in order to form in the Mind of any Person (though of the meanest capacity) a true Idea of the Earth, its Figure, its Natural and Politic State, with all its imaginary Circles; also the Motion of the Sun, as it appears to the Inhabitants of any Part thereof; how much or what Regions are illuminated, and what are enveloped in total Darkness at any given Time, the Periodical Seasons, etc. The Method contains a curious Collection of about 40 Select Geographical Problems, which will be properly introduced with ample Definitions; a Copious Description of the Terraqueous Globe, and the whole interspersed with entertaining Remarks on the various Manners of the Inhabitants, Products of the Countries, etc., in order to lead Youth insensibly with these necessary, advantageous, and Pleasant Parts of Science; to which will be added a true and lively companion of the Terrestrial Globe and Terraqueous Plausphere; also a Method laid down whereby all the Material Geographical Problems may be solved by a common Map of the World to a sufficient Exactness.

"A Thing entirely New:—

"Also, a set of new and Curious Problems concerning the Harvest Moons, and Dog Days, proving the last (on a supposition they commence when Sirius rises Cosmically) to begin at a Time far distant from that in our common almanacks. A more noble, pleasant, and useful Brand of human learning cannot offer itself to the View of Young Gentlemen and Ladies, Tradesmen, Readers of the Classics, Historians, Persons who divert themselves with reading News Papers, and all Lovers of Science in general.

"N.B.—The definitions and Problems will contain about 10 Lectures, which will be each lectured twice,

By John Hamer, Math.,

Who teaches Writings and Accounts, *Surveys and Maps, Gentlemen's Estates, etc.* The Premium, 5s., to be paid at the first Lecture. To begin on Monday, the Second of November, at a Room up one Pair of Stairs, at R. Whitworth's, *over against the Exchange, in Manchester.*—From Whitworth's "*Manchester Magazine.*"

PROCEEDINGS OF THE SOCIETY.

JANUARY 1ST TO JUNE 30TH, 1893.

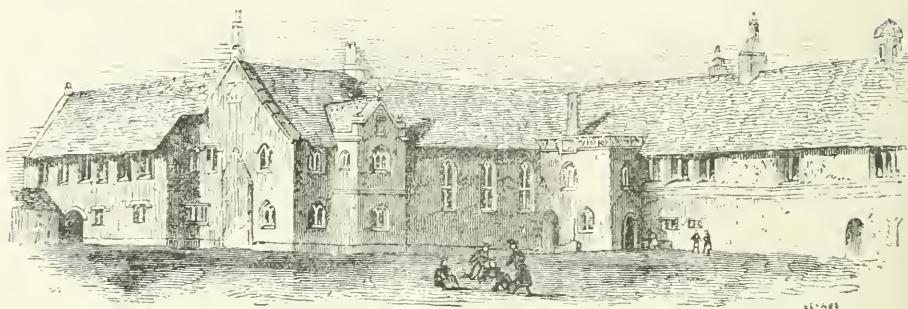
The 233rd Meeting of the Society, held at Chetham College, Saturday, January 14th, 1893, at 3 p.m., the Rev. S. A. STEINTHAL in the chair.

Mr. W. T. BROWNE, the Governor, received the members, who were then divided into three companies, under the guidance of Mr. Browne, Mr. O'Connor, and the Secretary, and a thorough inspection of the College was made. The photographic section examined the buildings with the view of making an extensive photographic survey during the summer, to illustrate a paper on the College and its library, to be prepared for the next session.

Returning to the schoolroom a number of MSS. and books were exhibited, and Mr. Belisha very kindly read from an old Septuagint version some verses of Genesis.

After tea, which was served in the Refectory, hearty thanks were given to the Feoffees, Mr. Browne, and his assistants.

The following illustrations will be of interest: (1) A view of the College Buildings from the Yard. (2) A portrait of Humphrey Chetham, with his autograph. (3) The arms of the Chetham family. (4) The autograph of Dr. Dee, Queen Elizabeth's Magician, and the friend of Sir Walter Raleigh and Frobisher. (5) The principal Gateway in Long Millgate. The buildings to the right and left are the Old Grammar Schools, now rebuilt. (6) The old Sun Inn, Long Millgate, opposite the gate. A former resort of Literary Bohemians.



A VIEW OF THE COLLEGE BUILDINGS FROM THE YARD.



Humphrey Chetham

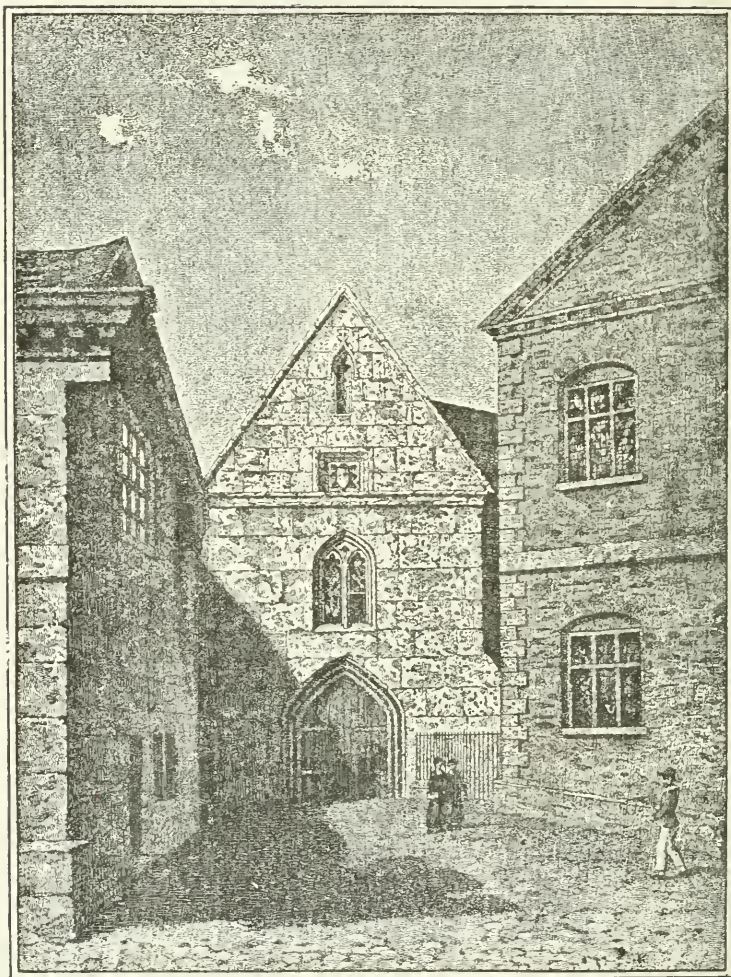
A PORTRAIT OF HUMPHREY CHETHAM, WITH HIS AUTOGRAPH.



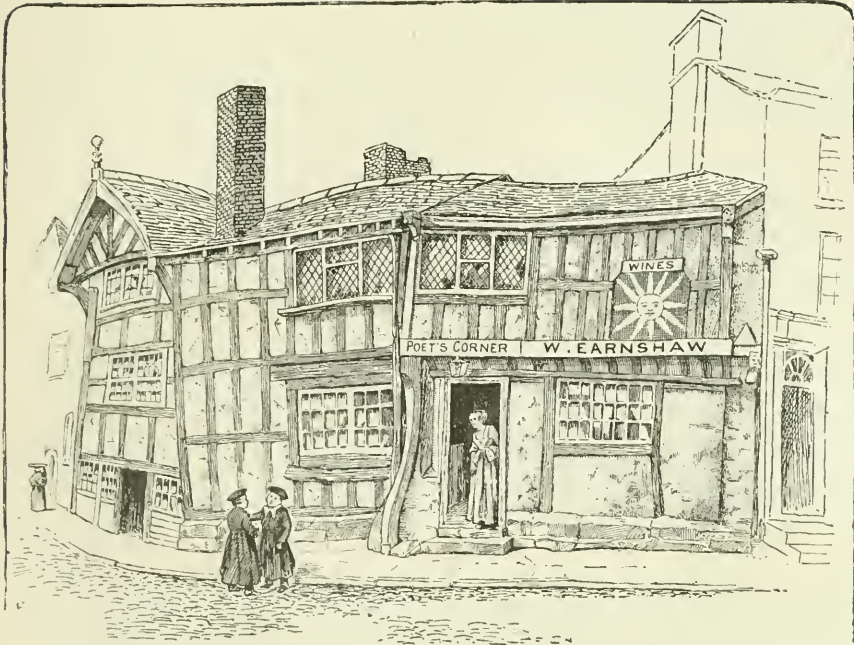
THE ARMS OF THE CHETHAM FAMILY

*John Dee:
Warden:*

THE AUTOGRAPH OF DR. DEE.



THE PRINCIPAL GATEWAY IN LONG MILLGATE.



THE OLD SUN INN, LONG MILLGATE.

The 234th Meeting of the Society, held in the Memorial Hall, Friday, January 20th, 1893, at 7-30 p.m., the Rev. S. A. STEINTHAL in the chair.

Mr. E. G. RAVENSTEIN, F.R.G.S., addressed the members on "Europe in Africa," illustrating his address with maps, diagrams, and lantern slides.

The address was listened to with great attention, although the members did not agree with some of Mr. Ravenstein's remarks. The time, however, had so far gone that no discussion was possible, and the vote of thanks closed the meeting.

The 235th Meeting of the Society, held in the Chemical Theatre, Owens College (by permission of the Principal), Saturday, January 21st, 1893, at 3 p.m., the Rev. S. A. STEINTHAL in the chair.

Mr. E. G. RAVENSTEIN addressed the members on "Geography in Schools," and illustrated his address with a new local map of Glamorgan, and Mr. King's map of the borders of Lancashire and Yorkshire, and with a set of lantern slides of Africa.

The Society had invited teachers to attend the meeting, and a large number availed themselves of the invitation.

The Chairman and Principal Ward made some remarks before the address, and a number of members and teachers also spoke afterwards. The address was a useful one to the experts present, although it was felt that many of the admirable suggestions of Mr. Ravenstein had already been adopted by the teachers of primary schools

in this district. The question of the teaching of geography in secondary and higher schools was not much dealt with.

The Ven. Archdeacon WILSON moved a vote of thanks to Mr. Ravenstein, which was seconded by Mr. H. YULE OLDHAM, supported by Mr. Perkins, Mr. Scotson, and Mr. Wardale, and carried. Thanks were given to the College authorities for the use of the room.

The 236th Meeting of the Society, held in the Memorial Hall, Wednesday, February 1st, 1893, at 7-30 p.m., Mr. MARK STIRRUP, F.G.S., in the chair.

Mr. E. W. MELLOR, J.P., F.R.G.S., addressed the members on "The Valley of the Lower Loire" (see page 1), and illustrated his address with a series of views shown in his powerful lantern. A number of children from the Deaf and Dumb School were present and were most interested observers.

Mr. COTTINGHAM proposed, and Alderman BOSDIN T. LEECH seconded, a vote of thanks to Mr. Mellor for his address on this most interesting field of Historical Geography, and to his assistants for their manipulation of the lantern.

Chevalier FROEHLICH proposed a vote of thanks to the Vice-chairman of the Council on his first taking the chair after his election to that office, which was seconded by Mr. J. HOWARD REED.

The 237th Meeting of the Society, held in the Library, Tuesday, February 14th, 1893, at 7-30 p.m., Mr. THOMAS DENTITH in the chair.

Minutes of Meetings held December 23rd (231), 31st (232), January 14th (233), 20th (234), 21st (235), February 1st (236) were read and approved.

The election of the following new members was announced :—

LIFE : Messrs. Alderman W. Healey, J. Arthur Hutton.

ORDINARY : Messrs. W. J. Alexander, Oliver P. Behrens, Edward A. Eason, George Hahlo, J.P., S. Hinrichsen, George O. Mackenzie, Horace C. Martin, J. T. Ogden, P. J. Ramsay, Louis Simon.

ASSOCIATE : Mrs. E. B. Hinners, Rev. J. S. Brown, Messrs. C. Roeder, J. D. Sugden.

Presentations to the Library were announced and correspondence was read.

HER MAJESTY THE QUEEN.

Copies of the Journals have been forwarded to Her Majesty the Queen, H.R.H. the Duke of York, K.G., and His Holiness the Pope, and the following acknowledgments have been received :—

"Privy Purse Office, Buckingham Palace, S.W.,

"9th January, 1893.

"Sir Henry Ponsonby is commanded by the Queen to thank Mr. Sowerbutts for the three volumes of the Proceedings of the Manchester Geographical Society which the Council have been kind enough to send to Her Majesty."

H.R.H. the Duke of York, K.G., President of the Society :—

"Marlborough House, Pall Mall, S.W., 7th January, 1893.

"Dear Mr. Sowerbutts,—I am to convey the thanks of H.R.H. the Duke of York to the Council, for the Proceedings of the Society they have been good enough to send him.—Yours very truly,

(Signed) "F. DE WINTON."

His Holiness the Pope:—

“Collegio Inglese, Roma, 17th February, 1893.

“Dear Mr. Sowerbutts,—I have duly presented the three volumes of the Proceedings of the Manchester Geographical Society to the Holy Father, who desires me to express his thanks to the Society for their thoughtfulness in sending to him the results of their meetings, and his hope that you may continue to proceed with increasing ardour and success.—Believe me to be, yours faithfully,

(Signed) “HERBERT CARDINAL VAUGHAN.”

The last three volumes of the *Journal* have also been sent to Mr. Hy. Cruse, one of the Paris members of the Society, for presentation to the President of the French Republic.

Letters were read from the Secretary of the Imperial Institute, the Principal of Owens College (Dr. Ward), the Director of Military Intelligence, the Geographical Society of California, and others.

The following papers were read: “Hints on Reconnaissance Mapping in Unsurveyed Countries,” compiled in the Intelligence Department, War Office (see p. 49); “The Condition of Suakin and District,” by Mr. A. B. Wylde; Speech of the Governor of British Honduras, H.E. Sir A. Moloney, on the progress of the country; “Native Wars in Portuguese East Africa,” by Mr. R. E. Dennett.

The question of excursions was then considered, and votes of thanks closed the meeting.

The 238th Meeting of the Society, held in the Memorial Hall, Friday, February 17th, 1893, at 7-30 p.m., Mr. MARK STIRRUP in the chair.

The Rev. J. T. F. HALLIGY, F.R.G.S., of York, addressed the Society on “The Yoruba Country, Abeokuta and Lagos,” (see p. 28). The address was illustrated with a large number of lantern slides and photographs taken by Mr. Halligy, and a collection of native cloths, jewellery, metal work, musical instruments, fetishes, and other objects.

Mr. FAIRLIE, the secretary of the African section of the Chamber of Commerce, also gave some interesting information, and moved a very hearty vote of thanks to Mr. Halligy for his admirable address. Mr. BRADLEY seconded the motion. Several questions were asked which Mr. HALLIGY replied to in acknowledging the vote.

The 239th Meeting of the Society, held in the Memorial Hall, Wednesday, March 1st, 1893, at 7-30 p.m., the Rev. S. A. STEINTAL in the chair.

The Rev Canon FRANKLIN, of St. Mary's Cathedral, Newcastle-on-Tyne, addressed the meeting on “Palestine.” The Canon gave a geographical description of the country and, with the help of a large number of photographic slides, illustrated his address, giving an itinerary from Joppa, by Jerusalem, Jericho, along the Jordan to Lebanon, and from Beyrout down the coast to Joppa, showing also views in Galilee, the Hauran, the desert, and Damascus. The address was received with great pleasure by the members, and by a large number of the Jewish community, who had the gallery placed at their disposal.

The Very Rev. Dr. CASARELLI moved that the best thanks of the Society be tendered to Canon Franklin. Mr. B. J. BELISHA seconded the motion, which was supported by Mr. HERBERT BIRCH, and carried. The Rev. Canon replied to questions.

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The 240th Meeting of the Society, held in the Memorial Hall, Saturday, March 4th, 1893, at 7-30 p.m., the Rev. S. A. STEINTHAL in the chair.

Mr. F. C. SELOUS gave an address on "Travel in South Africa," (see page 45). The address was illustrated by lantern slides, and by a number of splendid lion skins.

A very hearty vote of thanks was proposed by Mr. GEORGE HARKER, seconded by Mr. J. BARKER, and a request was made that he should tell the story of one of the lion skins. Mr. SELOUS responded, and, having replied to questions, gave a most fascinating account of the capture of one or two of the lions.

The 241st Meeting of the Society, held in the Library, Wednesday, March 15th, 1893, at 7-30 p.m., the Chevalier R. FROELICH in the chair.

The minutes of meetings held February 14th (237), 17th (238), March 1st (239), and 4th (240), were read and approved.

The election of the following members by the Council was announced :—

AFFILIATED—The Borough of Salford Free Library.

CORRESPONDING—Hon. J. V. Brower, of St. Paul, Minn.

ORDINARY—Mr. J. R. Pickering.

ASSOCIATE—Mr. Harry Lee.

A large number of presentations were announced.

Mr. William Aldred, F.C.A., and Mr. Theodore Gregory, F.C.A., were elected hon. auditors of the Society.

Letters were received from Admiral Cave on the Admission of Ladies to the Royal Geographical Society, and from the Secretary of the African Congress at Chicago.

Communications were read from Mr. G. E. T. Smithson on "The Establishment of a Flotilla and Transport Company on the Zambesi;" from Rev. J. E. Roy, D.D., on "The Higher Education of the Negroes;" and a communication from H.H. the Prince of Monaco, of which the following is a translation, on a project first introduced by him before the Academy of Sciences of the Institute of France :—

PROJECT FOR METEOROLOGICAL OBSERVATIONS IN THE ATLANTIC.

BY H.H. PRINCE ALBERT OF MONACO.

My various voyages, and my researches in Oceanography have, for some time past, caused me to consider the advantages which will accrue to meteorology by the establishment of observatories on some of the islands in the Atlantic.

Until lately a favourable time had not arrived for bringing this question forward, as one of the most important groups of islands, the Azores, was not connected by telegraph with any continent. A French company is about to supply the want; it has obtained the concession for a Transatlantic cable, and the work should certainly be finished in the course of 1893. When this is done it will be possible to know at any time, by telegrams sent from Cape Verde, the Antilles, Bermuda, and the Azores, the course of atmospheric disturbances which may form in the Atlantic; and weather forecasting will make great progress, pending the creation of similar stations on all the seas of the globe, which will probably follow.

Observations collected and summarised at the Cape Verde Islands would be interesting, as these islands are situated near the region where most of the cyclones originate which pass over the Antilles and the United States, and which, diverging towards the east, often reach the coast of Europe.

For a second observatory the Bermudas are in a position to be of use to our own continent, as we may safely say that the majority of disturbances, of which the centre passes in the neighbourhood of these islands, will have more or less influence on Europe.

Then the Azores, situated almost in the centre of the curves followed by the movement of atmospheric disturbances produced on the Atlantic, and those traced by the circulation of surface currents, would be suitable for a third station.

Mount Pico, rising to a height of 2,222 metres (7,290 feet) on one of these islands, might also be used for a supplementary post, which would furnish observations on the movements of the upper strata of the atmosphere in the middle of the Atlantic.

If, in addition to the observatories mentioned, others were established at Madeira and the Canaries, the more complete system of observations would give better results.

All these stations might collect observations made at sea, day or night, by ships arriving in port, and in this way would frequently widen, by several hundreds of miles, the circle of observations, which would furnish to each post the elements of its meteorological despatches.

The Principality of Monaco, where a meteorological observatory already exists, created and directed with great skill by Dr. Gueirard, would consent to centralise all these oceanic observations, to draw up the results for the forecasting of the weather, and to communicate these results to all interested centres.

It seems to me that the best course to follow to attain the realisation of this plan would be to bring about an understanding of the countries most interested in the progress of practical meteorology; by this we would gain more homogeneity in the methods followed. I therefore intend to propose a congress of savants appointed by the different countries, who would bring the results of their special knowledge to bear upon the final settlement of the scheme.

A vote of sympathy with the Yorkshire Union of Institutes, on the death of Mr. Thomas Dawson, was passed.

Letters were read from Lord Egerton of Tatton, thanking the Society for their vote of sympathy, forwarded to his lordship on the lamented death of Lady Egerton; from the Stuttgart Geographical Congress, to which Mr. Zimmern was elected delegate; from Mr. J. V. Brower, Commissioner of the Itasca State Park, Minnesota; and from the Royal Geographical Society, conveying the following resolution.—

[COPY OF RESOLUTION.]

ROYAL GEOGRAPHICAL SOCIETY.

The following privileges should be offered to such of the Geographical Societies of the Empire as shall from time to time be recognised by the Council as Corresponding Societies :—

1. All Fellows and members of such Geographical Societies to be allowed while in London the privileges of admission to the Society's meetings, and of the use for purposes of reference of the Maproom and Library.

2. The Presidents and Secretaries of such Societies to be invited to the banquets and entertainments of the Royal Geographical Society as guests of the Society.

3. A copy of all the publications of the Society to be sent to such Societies, and their members to be allowed to purchase copies of the same on the same terms as Fellows of our Society pay for extra copies.

4. Diagrams, slides, and hand-maps, the property of the Society, to be lent for the use of such Societies in the United Kingdom on the same terms as they are now lent to the scientific societies of the metropolis. Copies of any such geographical material to be supplied to the Geographical Societies of the empire at cost price.

The Manchester Geographical Society has been accepted as a corresponding Society of the Royal Geographical Society, and these privileges are therefore now open to our members.

The 242nd Meeting, held on board the S.S. Pioneer, in the Bridgewater Canal, Saturday, March 25th, 1893.

The boat was very kindly placed at the disposal of the Society through Mr. Derbyshire Mayall. The start was made from Stretford at nine o'clock. The day was perfect, and the members were interested by the Bridgewater Canal and the places through which it passes, some seeing the canal for the first time, and others renewing the acquaintance they had made in the days of the old swift packets. The passage was, however, so slow that on arrival at Runcorn it was felt to be impossible to complete the programme of the journey.

A large number of members were led by Mr. J. Edmondson to view the Ship Canal works, and, after a most interesting inspection, the return was made from Runcorn Station.

The 243rd Meeting of the Society, held at Blackburn, Monday, April 3rd, 1893, at 5-30 p.m.

A party of members visited Hoghton Tower, and were met by Sir Charles de Hoghton, Bart. Some hours were spent in looking over the house and in inspecting the collection of curiosities, Russian pictures, atlases, and maps. The thorough renewal of the stone and wood work of the Tower was observed with much pleasure. Descriptions were given of the geology, archæology, history, and folk-lore of the district and the history of the Tower and its principal architectural features were discussed. On the motion of Mr. A. GREG, seconded by Mr. T. DENTITH, Mr. Cottingham presented the thanks of the Society to Sir C. de Hoghton, who has spent a large sum of money in restoration with very good effect, and said he was very glad his thirteen years of restoration had pleased the members.

The return was made to Blackburn for tea, after which the party drove in a circuit through the park to the top of the Revidge and back to the station.

We have permission to use three illustrations of Hoghton, which give a fair idea of the Tower; they do not accurately represent the present condition. The illustrations are: No. 1, The Outer Court and Gateway. No. 2, The Inner Court and Statue of King James; this has been displaced and a Statue of King William III. (from an old hall at Walton, now destroyed), put in its stead. The glass in the window to the left is stated to be of the 12th or 13th century. No. 3, The Fire-place in the Banqueting Hall. In this room is the table, and it was in this room King James is said to have knighted the loin of beef, which lay on the table in the room.

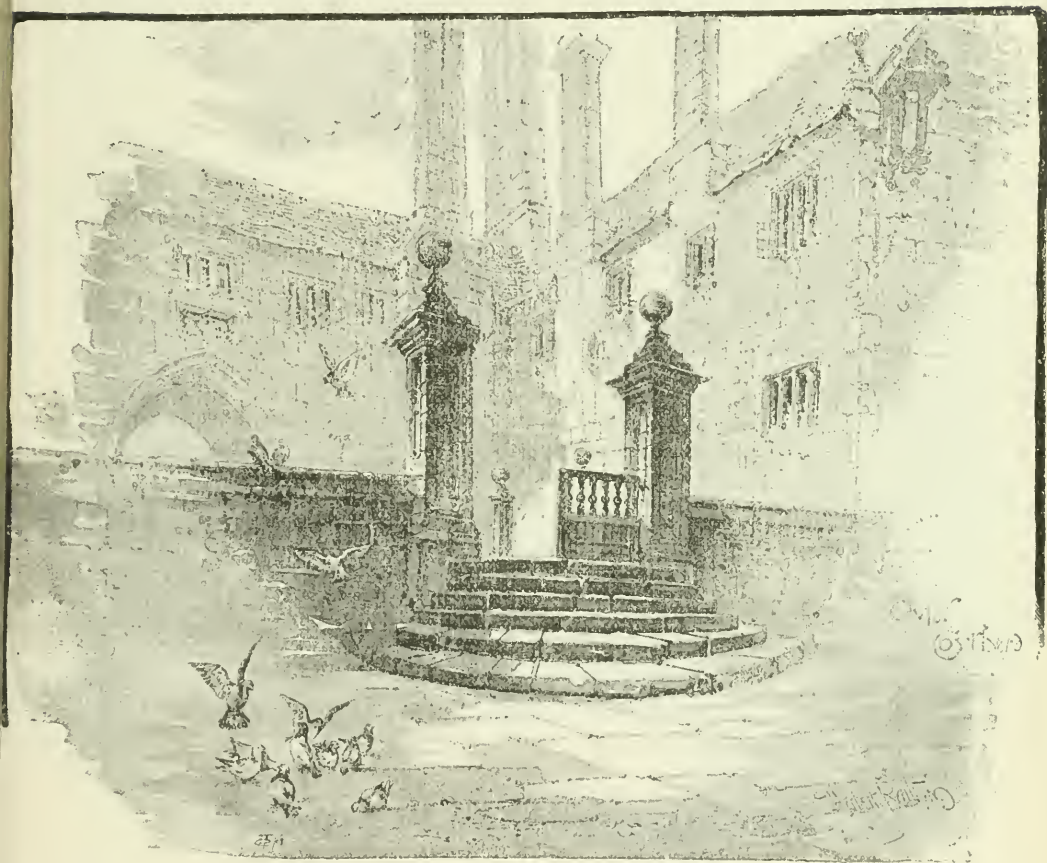
The 244th Meeting of the Society, held in the Memorial Hall, Wednesday, April 12th, 1893, at 7-30 p.m. Mr. MARK STIRRUP in the chair.

Colonel C. SWINHOE, M.A., F.L.S., of Oxford, addressed the members on "Protective Resemblance and Mimicry in Nature," illustrating the address with lantern slides of fishes, reptiles, and insects.

Professor MILNES MARSHALL proposed, and Mr. W. E. HOYLE seconded, a very hearty vote of thanks to Colonel Swinhoe, which was supported by Mr. COSMO MELVILLE and carried.

The SECRETARY mentioned the death of Sir C. de Hoghton, Bart., and it was resolved that a letter of condolence should be sent to Miss de Hoghton.

The 245th Meeting of the Society, held at Mrs. Timperley's (near the Big Tree), Dunham Massey, Saturday, April 15th, 1893, at 5 p.m.



THE OUTER COURT AND GATEWAY. (See page 84.)

A large number of members met at Altrincham Station, and, under the leadership of Mr. Benjamin O'Connor, visited Dunham Park. The walk was much enjoyed, but the sad condition of the trees in the park was commented upon.

An address on the district was given, and after tea the old church and yew tree were visited.

The 246th Meeting of the Society, held in the Library, Monday, April 17th, 1893, at 7-30 p.m., Mr. J. D. WILDE in the chair.

The minutes of meetings held March 15th (241), 25th (242), April 3rd (243), 12th (244), 15th (245) were read and approved. Presentations to the Library were announced.

A large amount of correspondence was read. Communications in relation to the projected Arctic journeys of Mr. Peary, Dr. Nansen, and Mr. Jackson; from



THE INNER COURT AND STATUE OF KING JAMES. (See page 84.)

Mr. F. Hatch, Wellington, New Zealand, on the Progress of the Colony; from Mr. N. Melnikoff, of the Crimean Alpine Club, Odessa, on the Ancient Canal of Perekop, were read.

Canada and the Manchester Ship Canal, Floating Warehouses on the Zambesi, the approaching Solar Eclipse, and other questions were also referred to in the discussions which ensued on the papers. The further consideration of proposed excursions brought the meeting to a close.

The 247th Meeting of the Society, held Wednesday, April 26th, 1893, at 5-30 p.m.

The Secretary led a party of the members through Prestwich and Mere Cloughs. A short address was given and reference made to Mr. Crook's address, in which the map of this district was taken to illustrate the principle of contour lines. The evening was pleasant, and the short walk was much enjoyed by the members.



THE FIRE-PLACE IN THE BANQUETING HALL. (See page 84.)

The 248th Meeting of the Society, held at the Memorial Hall, Wednesday, May 3rd, 1893, at 7-30 p.m., the Rev. S. A. STEINTHAL in the chair.

Mr. H. T. CROFTON addressed the Society on "Vestiges of Village Communities," The address was illustrated with several diagrams prepared by the Victorians, and was listened to with much interest.

Mr. Charles Perkins and other members took part in the discussion. A hearty vote of thanks was tendered to Mr. Crofton, who replied, and thanked the Victorians for the diagrams. Mr. Reed responded for the Victorians.

The 249th Meeting of the Society, held at Southport, Saturday, May 16th, 1893.

A description of the district was given, in which Mr. Stott, Mr. Richardson, and others took part. The Convalescent Home was visited, and also the Pier, Lakes and the new extensions of the town. Tea was obtained at the Churchtown Gardens, the members being there met by Mrs. Wood, who very kindly gave the needful botanical information.

Thanks were passed to the leaders and the members returned to the train.

The 250th Meeting of the Society, held at Lucerne, Switzerland, May 22nd, 1893.

Under the guidance of Mr. Dean, jun., a party of members and friends made a pleasant tour to Antwerp, Brussels, and various places in Switzerland, leaving on May 20th and returning on the 30th.

The 251st Meeting of the Society, held in the Library, Wednesday, May 31st, 1893, at 7-30 p.m., Mr. THOMAS DENTITH in the chair.

The minutes of Meetings held April 17th (246), 26th (247), May 3rd (248), 16th (249), 22nd (250), were read and approved. The election of the following members as announced :—

ORDINARY: Miss Goulden, Messrs. R. Swindells, M.I.C.E., and James Winterbottom.

ASSOCIATE: Mr. J. W. Lloyd.

Presentations were announced and exhibited. Letters were read from Lady Derby, acknowledging the vote of condolence on the death of the late Earl of Derby; from Miss de Hoghton, thanking the members for their sympathy on the death of her brother, Sir C. de Hoghton; from Mr. R. E. Dennett, of Landana; from the Royal Geographical Society of Australasia, New South Wales Branch, pointing out that the Society was first established in 1883 at Sydney, and that Mr. J. H. Maiden formed the Queensland Branch in 1885. Numerous other letters were also read.

A letter of congratulation having been sent to H.R.H. the President, the following reply had been received :—

“Marlborough House, Pall Mall, S.W., 15th May, 1893.

“Sir,—By command of H.R.H. the Duke of York, I am desired to convey to the Manchester Geographical Society the heartfelt thanks of H.R.H. the Duke of York and of H.S.H. the Princess May, for the very kind congratulations and good wishes which the members of the Society have sent them on the occasion of their engagement.—I have the honour to be, Sir, your obedient servant,

(Signed) “F. DE WINTON, Maj.-Genl., Comptroller.”

The following communication had been received from the Chief Weather Bureau, Brisbane :—

THE FLOODS AT BRISBANE.

By Mr. CLEMENT L. WRAGGE, F.R.G.S., F.R. Met. Soc., Government Meteorologist of Queensland (late of Ben Nevis).

I send a few particulars of the recent remarkable rainfall at Crohamhurst, situated on the Western slope of Mont Blanc, a peak on a spur of the D'Aguilar Range, an offset from the Blackall Ranges, South Eastern Queensland. The whole of this district is watered by the Stanley River, a tributary of the Brisbane River, and hence the values given below were prominent factors in producing the terrible floods

from which we have suffered. I may mention that the observer at Crohamhurst is Mr. Inigo Owen Jones, one of my specially trained assistants, and that implicit reliance can be placed on his figures.

The following are the more phenomenal falls of the flood period at Crohamhurst :—

February 1	...	...	...	10·775 inches.
„ 2	...	...	..	20·056 „
„ 3	...	...	...	35·714 „
„ 4	...	...	...	10·760 „

The gauge is a standard of the “eight-inch” pattern, standing one foot above the ground, at an altitude of about 1,400 feet above mean sea level. The approximate latitude and longitude of Crohamhurst are 26° 50' S, 152° 55' E. The gauge was emptied every three hours night and day on the occasion of the greatest fall. I think meteorologists will agree that for a twenty-four hours' fall we have beaten the world's record.

The 252nd Meeting of the Society, held at the White Barn Hotel, Cuddington, Saturday, June 3rd, 1893, at 6 p.m., Mr. T. DENTITH in the chair.

Under the guidance of Mr. Benjamin O'Connor a party of members walked from the station through Delamere Forest to Oakmere, and thence to Cuddington. After tea a visit was made to the grounds of Vale Royal, belonging to the Earl of Delamere.

A thunderstorm having preceded the members, the scenery was much freshened in consequence. The characteristic features of this unspoiled district were described and discussed. Mr. BARLOW moved, and Mr. BURTON seconded, a vote of thanks to the leader.

The 253rd Meeting of the Society, held at the Carrington Estate of the Manchester Corporation, Saturday, June 10th, 1893.

Councillor Sherratt, Mr. Henry Whiley, and Mr. McConnell (the bailiff of Carrington), received the members and led them from Flixton Station to Carrington Moss, where a train of waggons was provided, by means of which the work of reclaiming the Moss and turning it into valuable farm land is very much assisted.

After tea, which had been kindly provided by Mrs. Whiley, Mr. IRLAM took the chair.

Councillor SNAPE moved a vote of thanks to the Cleansing Committee of the Corporation, to the leaders, and to Mrs. Whiley for her hospitality.

Councillor HIGHAM seconded, and Mr. STOTT, Mr. BARLOW, and others supported.

Mr. WHILEY, in responding, gave a history of the Cleansing Committee's operations on the Moss, and referred to the almost completed work here and the intended work to be done at Chat Moss, and the result in connection with the cleansing work of the city. The general opinion was that it would do a great amount of good if a large number of the ratepayers of Manchester could see the interesting and satisfactory way in which the disposal of refuse is accomplished on this farm.

Mr. Whiley led the members back to the station, past the Ship Canal works at Irlam, and they had the pleasure of seeing the railway diversion in use by the Cheshire Lines, the Irlam Locks and the splendid work of the Canal.

The 254th Meeting of the Society, held at Mrs. Lawton's, Tintwistle, Saturday, June 17th, 1893, at 6 p.m., Mr. IRLAM in the chair.

A large party, under the guidance of Mr. Charles Wild, drove from Stalybridge through Mottram, calling at the old church, where the Roe tomb and other monuments in the church, the fine marble pulpit, and the structure itself were inspected—the instructions with the visitors' book to write your name, wipe the pen, shut down the inkstand, and put money in the collecting-box for the restoration of the church, being duly observed. The drive was continued through Hollingworth, Tintwistle, past some of the Manchester reservoirs to Crowden. The reservoirs were found to be almost empty, though water was still running from the Crowden brook. The varied scenery, the lesson in sheep-shearing at the "Quiet Shepherd," the descriptions of the old halls and the natural features of the country, all contributed to the interest of the visit.

After tea, at Tintwistle, Mr. BURTON moved, Mr. ALDRED seconded, and Mr. STOTT supported, a vote of thanks to Mr. Wild for his kindness, at some inconvenience to himself, in leading the members in his native country. Mr. WILD responded.

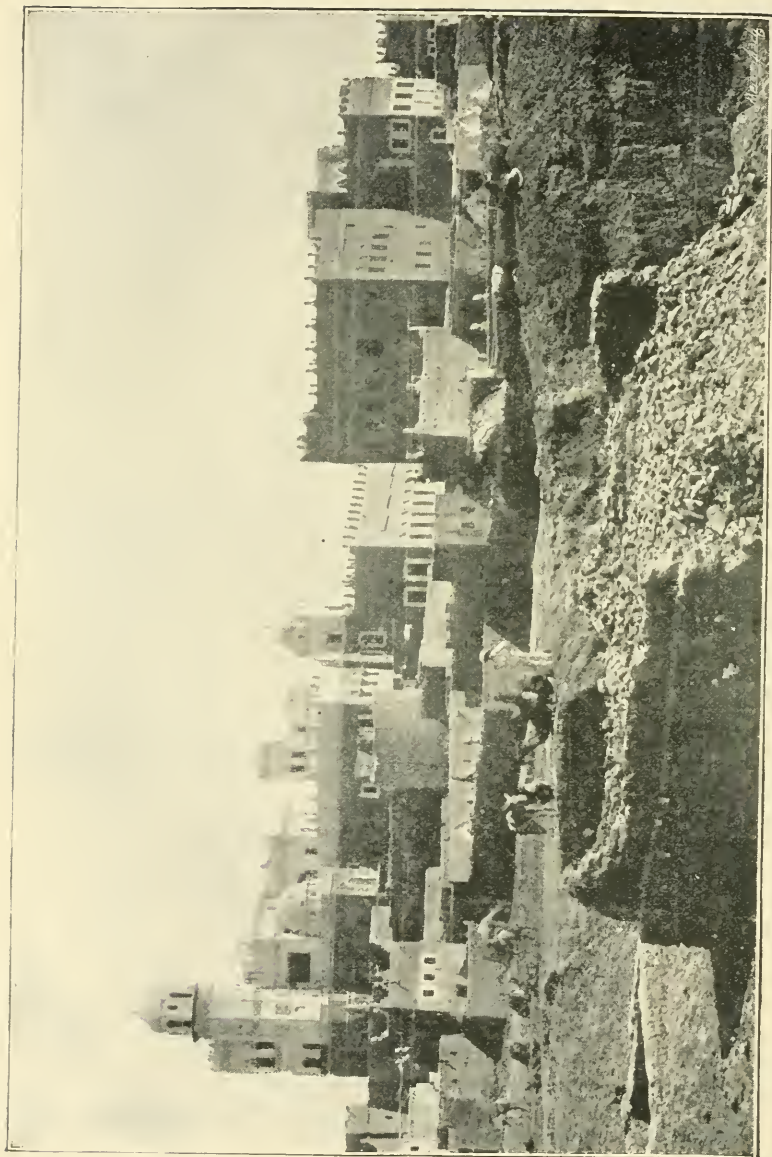
At Mottram the old Grammar School was pointed out, with its endowment of £180 a year and its 25 free scholars.

255th Meeting of the Society, held at Miller's Dale, Saturday, June 24th, 1893.

Professor Boyd Dawkins, a member of the Society's Council, led a party of members along the Dale and up the Tideswell Vale, calling at a disused quarry up on the side of the valley. The descriptions of the formation of limestone, the intrusion of volcanic rock, the consequent alteration of the various layers of rock in relation to their position and quality, the method by which nature excavates valleys in limestone, were admirably illustrated and enforced, the necessary examples lying to hand. The formation also of mineral veins was referred to, and some examples especially noted.

After tea, Councillor HIGHAM took the chair, when Councillor HAMPSON moved a vote of thanks to Professor Dawkins, which was seconded by Mr. EDMONDSON, supported by Mr. BARLOW, Mr. MATHER, Mr. STOTT, and Mr. BOWES.

The PROFESSOR responded, and expressed his willingness to lead another party on a future occasion.



PALACE OF THE SULTAN OF LAHEL.

(From page 162 of "A Journey through Yemen.")

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OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

VESTIGES OF VILLAGE COMMUNITIES.

By MR. H. T. CROFTON.

[Addressed to the Society at the Memorial Hall, May 3rd, 1893, at 7-30 p.m.]

(See Map.)

AS children, the geography books teach us that there are forty counties in England, and that they are of various shapes and sizes, and with that we are most of us content without enquiring further as to their origin. As adults, a variety of governing bodies impress us with the fact that each county is divided into hundreds and parishes and townships, and having discharged with more or less dislike our involuntary obligations to these authorities, we let them pass without troubling our heads further about them. It is, however, unfitting for members of such a Society as ours not to attempt to fathom the why and the wherefore of some, at least, of these territorial divisions. They are manifestly of human origin, and there are few things done by the human race without some reason or object. The enquiry, too, is emphasized when a study of a map shows that in many cases these divisions possess scattered fragments within adjoining divisions, that fragments of one county are discovered within the next, and that pieces of parishes and townships are detached from the main body in like manner. The former erratic habits of a river occasionally account for some of these separations, just as we find along the present course of the formerly widespread River Mersey (which used to divide two kingdoms, and still divides our two counties palatine of Lancaster and Chester), bits of each on the wrong side of the river.

Such a reason as that will not furnish a universal explanation. We must seek elsewhere for the cause, and it will not be

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long before we come to the conclusion that the gregarious habits of mankind in some form or other are most likely to have originated these divisions. From that we are led onward to form an opinion as to whether the cause of some particular division is family, tribal, or national. The subject is manifestly complex, and it cannot be supposed that this humble effort of mine to focus our thoughts is to be regarded as in any sense final.

There is an extensive literature dealing with this and kindred matters, and it would ill become a humble disciple of such master minds as Kemble, Freeman, Stubbs, Nasse, von Maurer, Maine, Seeborn, Coote, A. N. Palmer, and H. Lewis, to pose as having fathomed and unravelled all the depths and intricacies of the subject. All I desire to do is, in obedience to the wishes of our secretary, to endeavour to place matters before you in such a light as to attract others to seek for a fuller, if not a complete, elucidation. The scope of the enquiry is so wide that we shall have to narrow its limits considerably for our purposes to-night, and we shall therefore have to make a bold rent in the manorial curtain which is drawn over the more remote system, styled the village community, in order to economise our time; and we must further direct our special attention to our own neighbourhood.

A "village community" denotes what is believed to have been once a common institution in this and most other countries, and what still continues to exist in that very conservative country called India.

It serves to convey to the mind of the initiated an archaic form of patriarchal life in which an Aryan tribe or family owned in common a territory, upon part of which they had their collection of houses surrounded by fields, some of which were set apart as pastures for their herds, while others were allotted either as meadows to be mown for winter fodder, or as fields for the cultivation of grain and other crops for man and beast.

The expression further brings up visions of curious customs of tribal inheritance and government, as well as exciting hopes of discovering fragments of former regulations for an equal participation in the land.

It has been the genial task of many to endeavour to reconstruct from these customs and fragments the village community as it is believed to have formerly existed in these islands.

It is not denied for a moment that the exigencies of human life could have given rise to the independent existence of analogous forms amongst other races than the Aryans; but it will be sufficient just now to treat the phrase as denoting an institution of Aryan origin.

This being so, it is as well to bear in mind how many Aryan races in succession have left their impression upon Great Britain.

In the days of long ago an Aryan people—which we commonly call Celtic—settled in Britain and disturbed the previous occupants, of whom we practically know nothing, and whom it is therefore no misnomer to style aborigines.

We are only imperfectly acquainted with nineteen centuries of the history of these islands, and it will be readily admitted that the commencement of human life in them was immeasurably more remote. It has, indeed, been conjectured that these islands were in prehistoric times inhabited by peoples, of whom the Esquimaux, the Basques, and the Etruscans, with their entirely different languages, are relics.

The Celts were displaced or disturbed by another Aryan race called Romans, who, after four centuries of impression, were succeeded by a third called Saxons, and they by a fourth called Danes, and finally a fifth Aryan element was introduced with the Normans.

The chief interest lies in attempting to lift the Norman, Danish, Saxon, and Roman veils to discover the Celtic or aboriginal treasures beneath; and it must not be forgotten that the sixth century was nearly complete before the last Celtic king, Cadwalladr, ceased to reign.

Languages are more readily changed than the habits of rustics, and nation may succeed nation and disturb the surface history of a country without much effect upon the peaceful tiller of the soil, who has less desire to convert his plough into a sword than a sword into a plough.

Our two counties palatine of Lancaster and Chester lay wedged in, as will be remembered, between the Celtic regions of North Wales and Strathclyde, and that these two counties were at one time equally Celtic will be probably conceded without marshalling more evidence than such place-names as Old Man of Coniston, Penygent, Mancunium, the grant by Egfrid, King of Northumbria, in A.D. 677, of the lands of Cartmel, "with all the Britons in it;" or pointing to the name of Hugh Cyveliog, Earl of Chester, or the name of Blethyn, which is still used by members of at least one old Lancashire family, the Hultons of Hulton Park; or the widespread Anglo-Cymric mode of counting by scores, especially preserved among shepherds, who count een, teen, tethera, pethera, pimp, heata, seata, ova, dova, dik, eena-dik, teena-dik, tethera-dik, pethera-dik, bumfit, eena-bumfit, teena-bumfit, tethera-bumfit, pethera-bumfit, iggan.

We start, therefore, with an admission that our counties were of old peopled by the Celts, and we ought therefore first to ascertain what is known of the Celtic village community.

The Welsh system was more especially a tribal one. The tribe was called a *cenedd* or kindred, and its affairs were controlled by a *brenhin* or chief, whose position was afterwards occupied by the lord of the manor. The tribe was subdivided into

households, and each household was called a *gwely* or bed, because, as described in the twelfth century by Giraldus Cambrensis, their house consisted of one room, probably circular, with a big bed of rushes laid along the wall, so that the whole household could warm their feet at the fire, which was in the centre below a smoke-vent in the roof. The tribesmen, who occupied the free tribal lands, were called *uchelwyr* or *breyr* (meaning statesmen, freeholders, or gentlemen), and were bound together for common defence, common tillage, and common law, and each held five free erwys or acre-strips. Besides the free tribesmen there were certain persons of an inferior grade, who were probably descendants of the races conquered by the Celts. These were called *taeogs* or *aillts*. The word *taeog* is found translated into Latin by *villanus* as meaning a dependant of a *villa* or manor, but strictly means "one protected;" while *aillt*, which is also translated into Latin by *villanus*, strictly means "one of another race," a gentile.

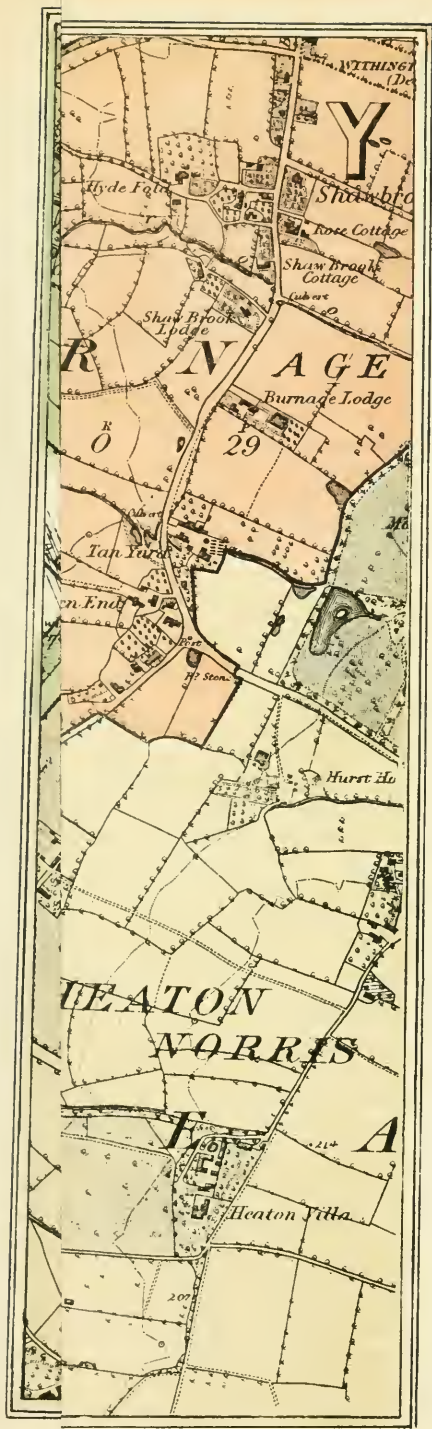
Tacitus mentions the Cangi, who were the servants of the Carnabii, and who tended their cattle and lived in the marshy grounds about Norton, Runcorn, and Frodsham, in North Cheshire, along the south side of the Mersey.—(Tacitus, Ann. Lib. xii. cap. 32.) These were probably *aillts*.

The occupations of the inhabitants have remained much the same, for in 1578 William Smith tells us that in Cheshire one-third of the enclosed lands were then used for tillage, which brought forth corn in great quantity, while the pasture ground was reserved especially for kine, and the oxen were very large, "with which oxen they do all labour."—(Helsby's "Ormerod's Cheshire," i., 130.)

These *taeogs* were, however, not slaves. They were apparently villagers or husbandmen, and had arable fields, ploughed with common ploughs, to which each contributed oxen. All adult *taeogs*, however nearly or distantly related, were absolutely equal amongst themselves, except the youngest son, who lived with his father, and inherited the *tyddyn* or homestead. Of this custom the tenure called *Borough English* is a survival, in which it is the youngest and not the eldest son that takes as heir. In case a *taeog* died, the land (but not the *tyddyn*) was divided afresh amongst all the *taeogs*.

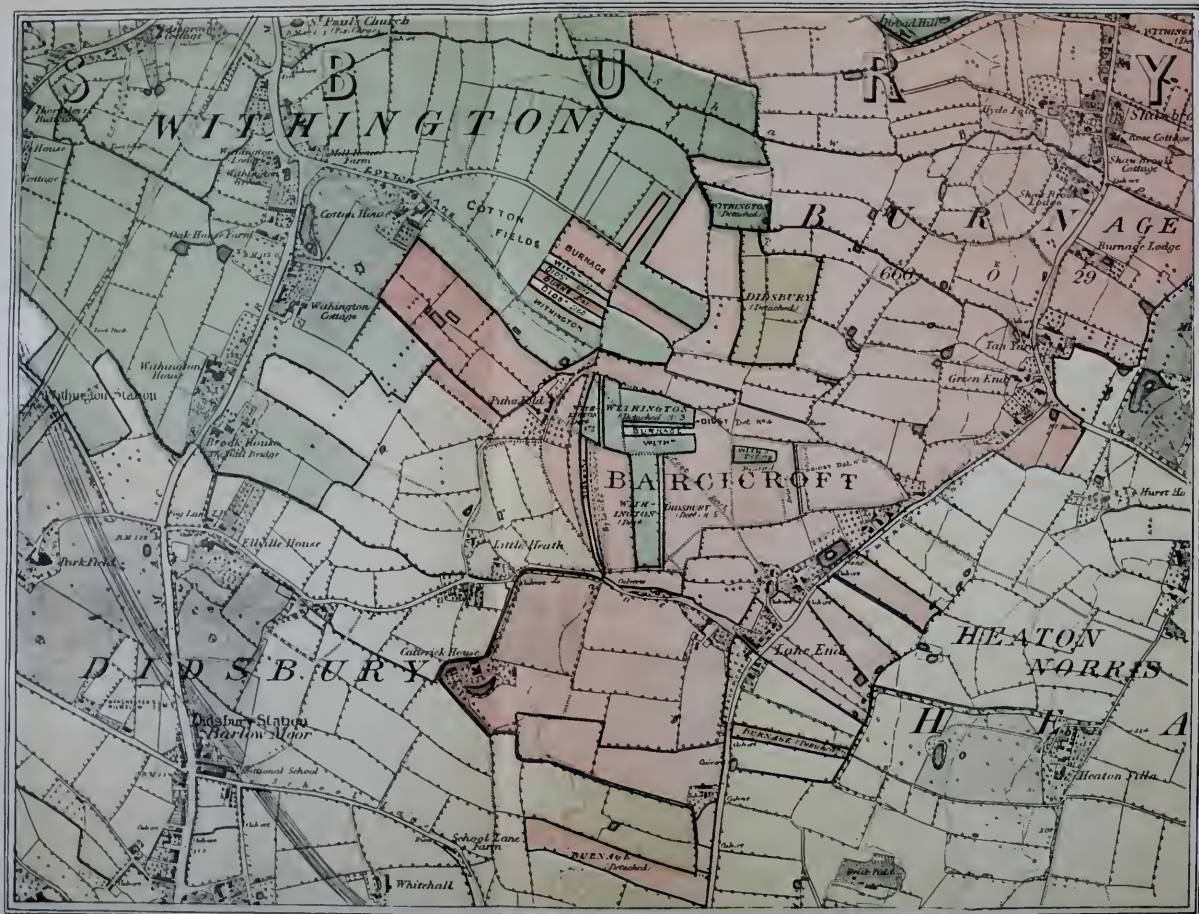
On the other hand, the *tir gwelyawg*, or land belonging to a Celtic freeholder, was held on his death by all his sons jointly. They all had equal rights in the scattered strips of arable and meadow land and pasture belonging to the holding, which was not broken up but was kept as a whole, and traces of this system survive in the gavel-kind tenure which exists in certain parts of England.

Both Dion Cassius and Cæsar, in their accounts of Britain, seem to have been mystified by these systems, and by this special



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To boundaries



From Ordnance Survey by H.T. Cotton

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Plan of Barecroft, Didsbury shewing also intermixed Township boundaries in the neighbourhood.

meaning attaching to the word *gwely* or bed. Dion says of the British: "They have their wives in common, and maintain all their children." Caesar says: "They have their wives in common among ten or twelve of them, especially brothers with brothers and parents with children." This horrible confusion is the more excusable, however, when we examine further into the *gwelyawg* system, for, while brothers were co-tenants in equal shares, when all the brothers were dead the first cousins took the holding on the same terms, and so in time it passed to the second cousins. These descendants of one ancestor all living together were called a *gweli-gordd* or bed-circle, and the entanglement may well have puzzled strangers such as Dion and Caesar.

Several homesteads were grouped together into a *maenol*, which was much the same as a manor. The whole Celtic system is found to be pervaded with a preference for the number four—which indicates a very primitive origin.

Thus, according to the Venedotian code, 4 erwys made 1 tyddyn, 4 tyddyns made 1 randir, 4 randirs made 1 gavael, 4 gavaels made 1 trev, 4 trevs made 1 maenol.

The word *trev* is believed to be the Celtic representative of the Aryan word which in Latin was *tribus*, and to be derived from a word meaning three, as indicating the three descents from the common ancestor.

The word *maenol*, however, savours of the Romans, as their officers were styled *maers* and *canghellors*, which are words of undoubted Latin origin. Each of these officers had a special appropriation of part of the village possessions.

With regard to the effect of the Roman conquest of Britain, India is an example of how a country may be conquered and governed without there being any need for the conquerors to sponge out all prior divisions of the land or affect to any great extent the lives and habits of the agricultural natives.

Many things indicate that the Roman conquest of Britain was on very similar lines to those of our Indian Empire. They found the country well populated and largely regulated on the system of village communities, grouped into tribes and nationalities, and all that was necessary was to group them for purposes of taxation. The Romans would therefore foster fixity of tenure, and under them and their successors sprang up the manorial system grafted on to or overlying, and more or less obliterating, the original grouping by village communities, but not abolishing the village communities, which continued their own placid existence.

We must not, however, quit our investigation of the typical village community. We have seen how the family or tribe was organised, and know that they owned, in common, the lands surrounding the village, but the mode of equal division of those lands requires attention. It was easy to divide the pastures

equally by regulating the number of each kind of beast feeding—so many cows, sheep, horses, goats, pigs, and so forth. It was more difficult to arrange for equality in the division of the arable portion set apart for ploughing, and meadows set apart for mowing and making hay, as a provision for the fodder of the cattle in winter. In the case of the meadows the division was effected by dividing the meadows into doles or strips, for which lots were drawn, giving rise to the term lot-meadows. After the hay crop was secured, these meadows were used for grazing purposes. The grazing season began at Lammas (1st August) and ended at Candlemas (February 2nd), when the land was shut up again for another hay crop. The name *Lammas* has nothing to do with lambs or the Mass, but means, etymologically, late math or mowing. Much the same plan was adopted with the arable land, though naturally the system was rather more complex and elaborate. The land was divided into blocks varying with the character of the ground, and each block or field was permanently sub-divided into strips for separate occupation; and, in some cases, for these strips lots were drawn, in which case the holding was called a shifting severalty.

In the parish of Torver, near Ulverston, the tenants of two adjoining portions of land, situated in the Old Town Field, change them yearly and have done so from time immemorial.—(Rev. T. Ellwood's address at Lancaster in 1890.)

In other cases it is probable that the strips were permanently held by the same individual. Very probably the custom varied according to the locality and the ideas of fairness held by the founders of each particular village community. The strips were divided by unploughed narrow ridges of grass called bylands, and across the ends of the furrows there was a headland on which the plough was turned, and sometimes this headland was ploughed with furrows at right angles to the rest. These features must not be forgotten. They will prove of use in searching for vestiges of the old village communities. Allowance has also to be made for the ancient ideas held upon the subject of rotation of crops. In some cases the system was to have three fields, so that each might lie fallow once in three years. This was termed the three-field system. In other cases each of the three fields was permanently used for a particular crop. This was termed the one-field system; and, so far as I have been able to make out, this was the system which was in vogue in this neighbourhood, where we find localities called Oldfield, Fallowfield, and Fairfield; and almost every village is found to have had its Townfield.

The village system was intended to be self-contained, and not to be dependent upon traffic with the outer world. Trades were hereditary. Smithwork would be peculiar to the family who afterwards took Smith as a surname, and to them would be

allotted a special part of the land held in common as a return for keeping the village ploughs in repair. This allotted land in time acquired the name of Smithfield. So, too, there would be a carpenter to look after the woodwork of the houses and implements, and a pound-keeper to look after stray cattle.

Land was also allotted to the priest, and we have in this neighbourhood, Kirkmanshulme, which was, and I believe still is, church property.

In 1388 a lease was granted of an acre of land, called *Le Prestysacre*, lying in Botlingsfield, in the town of Wigan, between land of Richard de Longeschagh and land of Thomas de Worthington.—(Hist. Soc. of Lancashire and Cheshire, 6 NS 285.) And we also find mention made of “a selion of land in the *Sherriffacres* in Lyverpull Field, between lands of Richard de Aynseough and Margaret de More,” *op cit* 292.

Account must also be taken of the very important regulations for the cultivation of the land by means of ploughs drawn by yokes of oxen. The plough itself was in some cases the common property of one family, while other families contributed pairs of oxen to draw the plough. Generally there were eight oxen in a plough team, and these eight were found by four families. The oxen were driven or directed by means of a goad, which holds a very important part in the business of allotting the land. The tallest man in the village community was selected, and the height of his hand held up over his head decided the length of his goad, with which he marked right and left of where he stood a piece of land called a rod or perch. He then proceeded to mark off in a line four such rods, one for each of the four contributors to the ox team. He next marked off at right angles to this line of four rods long another line of ten such rods, telling them off on his fingers, and continued this line for four such lengths, making forty rods in all. This was called a furlong, being the length of the furrows. The block of land, thus measuring four rods broad by forty rods long, was called an acre. This was the simplest and normal form; but the length of goad varied, and the number of rods in a furrow also varied. The numbers of individuals in the community may account for this, or the quality of the land or some other local circumstances. It is, however, curious to note that in North Wales, Cheshire, and South Lancashire, as well as in Ireland and the Isle of Man, the size of the acre was uniformly 10,240 square yards, as against 4,840 in a statute acre.

Cheshire and South Lancashire were part of Northern Powys, and were called by the Welsh, *Teyrn-llwg* (Kingdom of Llwg), which belonged to the Welsh until A.D. 613, when Æthelfrith won the battle of Caerlleon on Dee. In North Lancashire the acre was a little less, being built up from a pole of $7\frac{1}{2}$ yards instead of 8 yards. In Cornwall, which was another Celtic

quarter, two staves or 18ft. made a land yard (yard being the old name for a rod), and 160 land yards made an acre. This shows that in that Celtic area the same measures of four by forty made up the acre. The two Cornish staves indicate the right and left reaches of the ploughman's staff or goad. Our ordinary English acre has the same basis of measurement; but the goad or rod or perch being smaller, the resultant acre is also smaller.

It is remarkable that in Cheshire, even to the present time, fields containing a quarter of a Cheshire acre are extremely numerous, especially in association with the term "townfield." The acres and half and quarter acres were divided by grass balks, called bylands. A number of these acre strips alongside one another formed patches called furlongs, shots, butts, selions, and a variety of other names.

As time went on, and wars and pestilences made gaps in the family ranks of the village community, the system of holding in strips, for which lots were drawn, would tend to give way in favour of holding the strips permanently, and ultimately these several strips were enclosed. The transition was gradual, but is believed to have made great strides about the time of the Black Death (A.D. 1340).

As, however, customs relating to the cultivation of land are amongst the most persistent and enduring, traces of this ancient system are still to be met with in most counties, and we can now direct our attention to our own immediate neighbourhood.

The hundred of Salford is styled in Domesday "the *manor* or hundred" of Salford. Twenty-one berewicks belonged to it. These berewicks, we are told, were held by as many thanes for so many manors, but no mention is made of a manor of Manchester, although "Mamecestre" is mentioned. "The church of St. Mary and the church of St. Michael held in Mamecestre one carve of land free from all customs save geld;" and Radcliff Manor is expressly named. These berewicks were probably village communities, constituting mesne manors, which were at least of Saxon origin, and in Saxon times their government was probably directed from Salford. Under the Normans the old grouping of these village communities into the manor of Salford was broken up, consequent upon the division of the hundred amongst five knights, one of whom preferred to take up his abode in Manchester rather than in Salford, which thereupon sank into more or less obscurity, though still giving its name to the old area.

Manchester, or Mamecestre as it was called in Domesday, and Mancunium as it was presumably called by the Romans, was of prehistoric origin, and was itself once a mere village community, with its adjuncts of common fields, lammas lands, and lands appropriated for its various officials. Of these last, traces are

found on examining the earliest recorded field-names—*e.g.*, Millward Croft, in A.D. 1282; Keeperfield, Marshallfield, and Smithfield in 1322; Taine (Thane ?) Croft about 1320; at Ashton-under-Lyne there was “the Rhodesfield in the Thane’s Carr.” Of the common-lands of Manchester there are abundant traces in the records of the fields lying between Deansgate and the Irwell, as was pointed out in a paper published in vol. vi. of *The Manchester Quarterly*, entitled “Relics of the Common Field System in and near Manchester.” St. Ann’s Square occupies part of the ancient lammas lands of the Manchester village community. The holdings in it were separated by balks or bylands. It was called The Ackers, and a full account of the ceremonies attendant on the exercise of the public rights over it at the end of harvest was given in the same paper.

To the south of Manchester lay the sub-manors of Hulme and Withington, and, according to a charter of 33 Henry III. (1248-9), there was also a manor of Diddesbury (Harland’s “Mameceestre,” vol. i., p. 72, note 57—Cheth. Soc., vol. liij.). Of the village community of Hulme, I have not as yet found many traces, though there was at least one large common meadow. The villages of Didsbury, Withington, Burnage, and Rusholme have preserved evidence in greater abundance of their former equipment.

On glancing at the 6in. Ordnance Map, which shows the junction of the townships of Withington, Didsbury, and Burnage in the neighbourhood of Fogg Lane and Burnage Lane, the broken state of the boundaries excites enquiry. They are as jagged as a broken saw, and detached fragments are scattered about as if a bombshell had burst just there. What was the cause of this state of confusion? It is widespread, and the warfare is kept up along Lapwing Lane, past the modern Albert Park, up to the borders of Chorlton-cum-Hardy township. A detached piece of Withington township lay in the middle of an area south of Barlow Moor Lane, opposite the Manchester Southern Cemetery, surrounded by the township of Didsbury. This fractured condition of things is also found to be the case, though in a somewhat less degree, where the townships of Withington, Rusholme, and Moss Side come into contact.

It is evident that the conflicting interests of three private individuals cannot be the cause, but it is much more probable that the curious result was provoked by the conflicting claims of the bodies of inhabitants of the respective townships—in other words, by the village communities of Burnage, Didsbury, Withington, Rusholme, and Moss Side; and yet, when the case of Moss Side is considered, a shade of doubt crosses our mind as to the perfection of this explanation, from the fact that there is no evidence that there ever was a village of Moss Side. The five townships were all embraced by the manor of Withington,

and the lord of the manor very possibly adjusted in this way the rival claims of the various village communities within his manor. Those claims would be accentuated on the creation of any mesne manor, such as a manor of Didsbury, to which reference has already been made. We can imagine, too, that these villages were at one time severed by uncultivated tracts of land, and that as the villagers increased in number they were driven to take more and more of the borderland into cultivation, and it became necessary to define more precisely the interests of each in territory which was at one time grazed in common by the cattle of the three.

The commons in the New Forest are grazed by the cattle of a large number of parishes or townships.

It was in some such way as this, and not by any one supreme act operating at any one particular time throughout the kingdom, that townships became defined. They are of similar origin to 'Topsy' in "Uncle Tom's Cabin," who believed she never was born but grew.

This may seem all very conjectural and general, and we had better therefore condescend to particulars.

Wilmslow Road runs north and south, and the village of Withington is on that road four miles south of Manchester. A few hundred yards south of the village we come to Withington Green, and here we turn off down a lane running in a south-easterly direction. This is called Cotton Lane, but has no more to do with cotton than Fogg Lane has to do with fogs. The lane leads to a field or set of fields which, in Johnson's map of the Parish of Manchester, dated 1838, is marked "Cotton Town Field," and lies to the north of another field marked "Barsey Croft." What cotton in this case means will be clearer by referring to Cherry's "Stafford in Olden Times" (1890), where mention is made of "Coton Field, which was formerly cultivated on the three-shift system, the burgesses enjoying rights of common."—(*Athenæum*, 13th December, 1890.) This shows that the name has some connection with the joint ownership by three tons or townships. It was "co-town" land, and thus was related to "con-acre," a village community term, which there is no time now to discuss.

Cotton Field is, as a matter of fact, cut up amongst the three townships. Just before reaching Barcroft there is on the north side of Cotton Lane a strip belonging to Withington; lying side by side with that is a similar strip owned by Didsbury; then side by side comes one belonging to Burnage; and adjoining that Didsbury's turn is repeated, flanked by Withington with Burnage beyond. The three townships very possibly at one time took these strips in annual rotation, in the same way that the two tenants at Torver still yearly exchange portions. The tongue of land lying north-west of the block formed by these strips is

called the Sparthe, which is also a term frequently occurring in connection with common fields.

Passing on to Barcicroft, the state of affairs even at the present day is still more interesting, for we find not merely the townships taking strip after strip alongside one another, but within a township we find bylands dividing the "lands" of various owners, of whom there were formerly at least fifteen. The strips, too, are longer and thinner in some parts, though, as a rule, of about the same dimensions as those in the Cotton Town Field. Three strips belong to Didsbury, six to Withington, and the rest to Burnage. The pieces belonging to the different owners are called after them, *e.g.*, Hilton Field, Hilton Dole. In 1636 mention is made of "three doales, hallands, or parcels of land in a certen meane or comon feild, called Barsicrofte, within Wythington."

In North Lincolnshire a "hale" is a bank or strip of grass which separates two persons' lands in an open field (Peacock's "Manley and Corringham Woods"—Eng. Dial. Soc.), also a "garing" or "gore" in an enclosure or open field, or an angular piece that had to be ploughed separately. In Durham Halmote Rolls we meet with *haldailles* and *haldall*. The word is not rare in our own counties, in the forms *halland*, *hallond*, *holland*, *hallon*, *hallom*, *hallow*. At Stafford the Court Leet officials, called *halswains*, possessed meadow allotments in right of their office (Cherry's "Stafford"—*vide ante*).

In Barcicroft it will be observed that some of the blocks or series are at right angles to the others. This is in pursuance of the general rule, though the reason for the rule is only matter for conjecture. It probably originated in a desire to distinguish the lots, as well as to afford space for turning the ploughs.

The east end of Barcicroft, called The Sparthe, was shaped like the end of Cotton Field. In the fields between Millgate Lane, Didsbury, and the River Mersey some of the fields are still in divided ownership, with *merestones* to mark the boundaries. Here there is no mixture of townships, and the village community theory has full scope.

Reference has already been made to the township of Rusholme, which adjoins Withington on the north, with a district on the border-line bearing the significant name of Fallowfield, just south of the great Nico Ditch, otherwise called Nicker or Muckie Ditch, which runs for miles in an east and west direction. In Rusholme records there is clear evidence of the former existence of a common meadow, which was apparently near Norman Road, on the east side of Wilmslow Road, by Platt Bridge.

We will, however, direct our attention more particularly to an examination of the northerly boundary of this township.

About two miles south of the Manchester Cathedral we find on the maps a rather remarkable line running for some miles in

an east and west direction. This is partly the course of a reedy ditch, which began in Greenlow Marsh, at Longsight, on the Stockport Road, and, under the name of Malkin (malt-kiln) Brook, ran westwardly, separating at its easterly end the townships of Chorlton Row (now Chorlton-upon-Medlock) and a detached piece of the township of Moss Side, afterwards separating the townships of Chorlton Row and Rusholme, and, after joining the Cornbrook or Black Brook, separating the townships of Hulme and Moss Side. This line has an easterly continuation which separates the township of Ardwick and hamlet or township of Kirkmanshulme, and a westerly continuation which separates the townships of Stretford and Moss Side.

It is noticeable that none of these townships passed this rubicon, although a glance will show that the townships on each side were less regular in their boundaries. We also notice that the township of Moss Side is split into three pieces. The easterly part lies quite half a mile away from the other two, and is roughly rectangular. It is on the west side of the old Roman (probably British) Road from Manchester to Stockport, and Kirkmanshulme is on the east side of that road, and is roughly rectangular. The middle piece of Moss Side begins where Moss Lane East (formerly Clock House Lane) branches westwardly from Wilmslow Road. As you turn down Moss Lane East you have Whitworth Park on your right, and that is in Rusholme township, while on your left is the main body of Rusholme township, but the site of Moss Lane East, with a width of 30 yards, is in Moss Side township, the boundary of which, 57 yards further on, turns left at right angles for a distance of about 342 yards, then right for a breadth of about 127 yards, and then returns to the lane, and runs forward finger-like between the townships of Rusholme and Withington for 100 yards.

This middle piece of Moss Side terminates 60 yards before reaching the westerly end of Whitworth Park, and is shaped like a T with a thick down-stroke, down which runs a street called Parkfield, which was a former field name, and indicates an old parrook or enclosure.

For the next sixty yards the roadway is wholly in Rusholme township with Withington township running along the left side of the road.

After this interval of 60 yards we enter the main body of the Moss Side township, and the map shows further traces of the same angular interlocking of boundaries for the three townships of Withington, Rusholme, and Moss Side, which occurs in the case of the three townships of Withington, Didsbury, and Burnage. The angular blocks are due to a long since extinct system of allotment amongst the communities inhabiting the participant townships.

My object has been to show that, although these exact boundaries may possibly have been arranged under manorial direction, the participants who created the need for the division were the village communities, whose origin was far more remote than the manor under whose sheltering wing they lived and flourished, and I only hope that my attempt may serve as an indication that at our very feet lie new worlds for nineteenth century Columbuses to discover.

One word in conclusion, and that is to express my sincere thanks to the Victorians who have, at the expense of their leisure moments, prepared the very clear diagrams which have helped in a very marked degree to make my descriptions intelligible.

* * Anglo-Cymric mode of counting, page 93, may be illustrated by an extract from King's "Yorkshire." "The Nidderdale sheep score, in which the Celtic numeral names have been preserved in our Yorkshire dales, in almost as much purity as in Wales," is interesting :—

- | | | |
|-------------|------------------|---------------------|
| 1. Yain. | 8. Overro. | 15. Bumfit. |
| 2. Tain. | 9. Coverro. | 16. Yain-o-bumfit. |
| 3. Eddero. | 10. Dix. | 17. Tain-o-bumfit. |
| 4. Peddero. | 11. Yain-dix. | 18. Eddero-bumfit. |
| 5. Pitts. | 12. Tain-dix. | 19. Peddero-bumfit. |
| 6. Tayter. | 13. Eddero-dix. | 20. Jiggit. |
| 7. Later. | 14. Peddero-dix. | |

NOTICES OF BOOKS.

Mon Berceau. PAR PAUL VIBERT. A. Bellier and Co., Paris. 430pp., with illustrations. 3fr. 50c. 1893.

THIS is the history of the first ward of the city of Paris, by M. P. Vibert, in which "arrondissement" he was born. It is an interesting book, written by one of the prominent of the new school of French authors.

M. Vibert's book is more than a guide-book, but it is not history. He has no mercy for those who think differently from himself.

He is particularly hard on Royalties. "Une Famille des Bandits Royaux," and epithets of the like kind are plentiful.

To us the book is interesting as a study of the kind of writing which is not serious enough for history, and is yet not quite comedy.

It is an amusing, hysterical description of his own ward by the author. To him France is everything, and his own ward or "arrondissement" is the greatest place in the world.

The English Royalties and tradesmen are particularly obnoxious. It is not a book for children.

PROTECTIVE RESEMBLANCE AND MIMICRY IN NATURE.

BY COLONEL C. SWINHOE, M.A., F.L.S.

[Read to the Members, in the Memorial Hall, Wednesday, April 12, 1893.]

THE subject of this evening's lecture is Natural Protection, that is to say, the protection Nature has brought about through natural selection for the benefit and preservation of its creatures.

In Nature nothing is left to chance; every thing seems to be worked out under a grand scheme which goes on working year after year and age after age, which we call the great system of evolution.

Though man could not help seeing the great struggle for life that is always going on around him amongst human beings under which nations and individuals are always changing, and are compelled to adapt themselves to their surroundings, changing people morally, intellectually, and physically as the years go on, until recent years he refused to believe in the changes going on amongst animals from exactly the same causes, and would insist upon believing that every living animal now on the face of God's earth was exactly in the same form as God created it when He first made the world.

The great Charles Darwin first brought to light the doctrine of evolution and of never ending changes in life over thirty years ago, in his work called "The Origin of Species by Natural Selection;" and since then the subject has been most carefully studied by many eminent naturalists and very careful observers, and the conclusions arrived at are that Charles Darwin opened the doors of a great truth to the world, showing that the same changes that are always going on amongst human beings through the great struggle for life that is of a necessity always going on, are going on and have ever been going on throughout all ages amongst all living creatures, from the same causes, with this difference, that the changes in man are from natural causes, assisted and diverted by man's intellectual faculties, whereas the changes in lower life are purely unconscious changes, brought about in the course of ages by natural selection, to adapt the creatures to their surroundings and to preserve them in the

great struggle for life that is always going on—in other words, the survival of the fittest.

Now, this theory of natural selection or the survival of the fittest branches off in many directions, and would form subjects for very many lectures. To-night I am going to take only one small section, and to show you by the aid of magic lantern slides how different creatures are protected and their lives preserved through the colourisation and markings and other causes that have been brought about through the survival of the fittest.

On this great subject time will only admit of my entering into one or two phases. I will divide my lecture into three parts—

1. Protective Resemblance.
2. Aggressive Resemblance.
3. Mimicry.

Under the heading of Protective Resemblance I will show you pictures from most carefully executed photographs of animals that are coloured and formed to resemble their surroundings, so that they may be able to pass unobserved by their enemies and so escape destruction. Anyone who has got eyes to see with must have observed often enough that there are many creatures that bear a most remarkable resemblance to their surroundings. This applies to all orders of insects, to birds, beasts, and fishes, and I will take a very common case to roughly illustrate my meaning. Some of you who have lived in the North of England and in Scotland may know that in those parts the common stoat and the hare turn white every winter and become brown again every summer. Now, what I want to point out to you is, that this has been brought about by natural selection or the survival of the fittest. It is perfectly obvious that when the ground got covered with snow, as it does up there for months at a time, brown hares on the white snow would have very little chance of escape from their enemies, and such as did escape would be the palest of the hares, those that were least observable on the white snow, and of their young the palest again would survive, and so on from year to year and age to age, the palest always surviving, until in course of time there were none left except those that naturally became white in winter time; and so with the summer ones, white hares on the brown heather would have no chance, the darker they became in the summer the less conspicuous they would become; and thus in the course of ages none would be left except those that naturally became white in the winter and brown in the summer—that is what is called natural selection or the survival of the fittest.

There are many butterflies that exactly resemble dead leaves; these alway settle amongst dead leaves, and so become lost to the eye and protected from their enemies.

The following were exhibited :—

1. Lappet moth, English, on a deal board.
2. Ditto, in its natural place amongst dried leaves.
3. Indian oak leaf moth (*Kallima Inachis*).
4. Catterpillars of a common Indian hawk moth (*Pergesa Acteus*), on *Sissus* and on *Caladium*.
5. Chrysalis of *P. neri*, on green branch of orange tree (experiments of Mrs. Barber).
6. Ditto, fixed to dead branches covered with pale yellowish-green leaves.
7. Ditto, fixed to lid of box.
8. Spider in Lichen *Eleria prompta* (American).
9. Pipe fish, drawn from life (*siphonostoma typhle*), found on English coast, protected by its resemblance to grass wrack (*Zostera*), a grass-like flowering plant allied to lilies which grows in the sea like seaweed. The fish is always found amongst the leaves of this seaweed, the movements of a fish being like the movements of the leaves swayed by currents in the water.
10. Pipe fish, in sea grass, from sketch from life in Plymouth Aquarium.
11. Pipe fish, at home in sea grass.
12. An interesting example of adventitious protection is afforded by certain English crabs (*Stenorhynchus*) which fasten pieces of seaweed on their bodies and limbs (a sketch from life in the Plymouth Aquarium). Mr. Poulton tells us in his book on colours of animals that Bateson has watched the process: The crab takes a piece of weed in his two chelæ or claws, and, neither snatching nor biting it, deliberately tears it across, as a man tears paper with his hands. He then puts one end of it in his mouth, and, after chewing it up, presumably to soften it, takes it out in his claws, and rubs it firmly on his body or legs until it is caught by the peculiar curved hairs which cover them. If the piece of weed is not caught by the hairs, the crab puts it back into his mouth and chews it up again. The whole proceeding is most human and purposeful.
13. Another species of English crab (*Hyas Coarctatus*), taken from a dead specimen in Plymouth Aquarium, without its protective clothes.

14. The same clothed (a sketch from life).

The above are a few examples of protective resemblance, *i.e.*, where animals obtain their protection from their resemblance to their surroundings.

The next few slides I will show you represent Aggressive Resemblance, by which I mean colours harmonising with their surroundings, enabling them to approach their prey. In many cases, no doubt, these colours are protective as well as aggressive; but special aggressive resemblance appears sometimes to do more than hide an animal from its prey, it may even attract the

latter by simulating the appearance of some object which is of special interest or value to it.

15 and 16. Are two drawings of the walking turtle, taken from life in the Zoological Gardens, in London, where he can be seen any day performing the wonderful trick of attracting his prey, as shown in the second exhibit. In the first he is in his ordinary state in the water; in the second we see only his head. When tricking his prey he remains alongside of a rock, keeping as still as the rock which he so very closely resembles, and keeping his mouth wide open. He has two small red filaments on his tongue, which stand up and wriggle about like a couple of worms. These seem to attract small fishes, that go inside his mouth to eat them, on which the turtle closes his jaws, and the little fishes get eaten themselves.

17 and 18. Are two fishes (*Ceratias bispinosus* and *C. uranosa*) that live in the depths of the sea. The former was found in 360 fathoms and the latter in 2,400 fathoms. These pictures of them are designed from figures in the report of "The Challenger Expedition." These might be called lantern fishes: the depths of the sea are dark, and they are provided by Nature with a special phosphorescent organ which lights up their surroundings and attracts the creatures they prey upon.

Next we come to what is called True Mimicry, where a creature which is tasteful and is good food obtains its protection from its enemies by its resemblance to creatures of a noxious or distasteful nature in whose company it lives.

This seemingly extraordinary theory was first brought to light by Mr. Bates, in the year 1862, a naturalist of great eminence, who died only a few months ago. He was collecting and making observations in the valley of the Amazon, in America, and he was struck by the fact that amongst large numbers of distasteful insects he occasionally found other insects which were not distasteful, which were few in number, and which in colour and markings so exactly resembled the noxious insects as to easily escape observation—*i.e.*, until you caught them and carefully examined their structure you could not tell them from the distasteful insects in whose company they live. Since then the subject has been studied by many eminent naturalists and observers in the field, both at home and abroad, with the result that we find this fact to be the case everywhere, even, so to speak, at our own doors.

I have shown you in my first exhibits that there are butterflies that so exactly resemble their surroundings, like the leaf butterfly, which resembles dead leaves and settles on dead leaves, becomes lost to the eye in the midst of the dead leaves, and thus becomes protected from its enemies. Similarly, there are many creatures that are good food, and are eagerly devoured by their enemies, that obtain their protection by their resem-

blance to distasteful creatures in whose company they live, and in whose society they escape observation.

It is not necessary to go to other parts of the world for examples of this kind. We have many, as I said before, at our own doors.

19. For example, I will show you our clear wing moth, a moth found in Oxford. I have taken it myself on two occasions this year in my own garden there. You will see that this moth has a very strong resemblance to the common English hornet. If its likeness deceives man, it is still more likely to deceive its natural enemies. The first I found was when I was in my garden with a London friend. I was examining the decayed trunk of a tree when my friend called out, "Mind, you will be stung; here is a big hornet." I thought so too at first, but on looking closer I saw the peculiar shivering going on that a female moth invariably affects shortly after emergence. This creature carries out the imitation to the end, and, when seized, moves its body as if it were about to sting; but it is quite harmless.

20. The next slide represents—what anyone may see in the autumn in any Oxford garden—a drone fly (*Eristalis*), which resembles the drone or male of the common English bee. It frequently flies into houses, and may be seen walking in a very bee-like manner on the window panes. In addition to its striking likeness to a bee, it buzzes in a most alarming bee-like manner when captured, and moves its body in a way that is too suggestive for its capturer; and yet its anatomical structure is entirely different from that of the bee, and a superficial examination will show that it has only two wings instead of four possessed by bees. It often enters beehives and steals the honey.

Now, I would like to show you some examples of mimetic forms of butterflies from the East, some of which I have experimented on myself, and on which many other observers have also experimented.

21. The commonest butterfly in the East is that bronzy-red insect, *Danis chrysippus* and *Hypoliminus mysippus*. It is common everywhere in India, and in many places it is found in very large numbers. It belongs to a family that has many different species, and all are noxious. There are very few living creatures that will touch it. Usually many creatures prey upon butterflies, such as birds, bats, lizards, &c.; but these noxious butterflies have a nasty smell and seemingly an exceedingly nasty flavour; they therefore are very largely protected. I have seen tame lizards that were kept in a cage and fed regularly every day on butterflies—I have seen these lizards kept for three days without food, and then some of these bronzy butterflies were thrown into the cage to see what they would do with them. At first they ran greedily up to them, but as soon

as they came on them they stopped, and in a most comical manner threw their heads up and walked away sideways, and could not be induced to go near them again, whereas as soon as they were fed on other kinds of butterflies they greedily devoured them.

Now these distasteful butterflies, being left alone by nearly all birds and reptiles, are in great numbers, and in their company live many kinds of other butterflies and day-flying moths that resemble them so nearly in the colour and general appearance as to escape from their enemies by becoming lost in their crowd, and thus also become protected. This black butterfly is one of them. He is very active in his habits, and by his quick flight can take care of himself; but the females are always more sluggish, and, especially when heavily laden with eggs, would fall an easy prey to their enemies, but escape through their extraordinary resemblance to the distasteful creatures in whose company they live. Many experiments have been also made with these mimetic forms, and they are always found to be good food. They have no disagreeable smell, and as soon as a bird or lizard finds this out he eats them readily enough.

22. Here is another distasteful butterfly (*Euploea*), also to be found in large numbers, closely resembled by the female of another butterfly which is good food (*Hypolimnastis bolina*). The male, you will see, is quite different.

Now, this tasteful butterfly is a rather extraordinary case in point. He is found in many localities, always comparatively few in number, always in the company of the crowds of distasteful butterflies of the locality in which he lives, sometimes resembling the noxious butterfly in the female and sometimes in both sexes.

23. *H. Bolinus Celebes*, resembling *D. chionippe* in the female only.

24. The same insect, from the Milete Island (Soliman group), resembles *E. pygmaea* in both sexes.

25. The same insect, from another island of the Soliman group, resembling *E. polymena*.

26. The same insect from the island, resembling *E. hopferi* and two examples from Africa.

27. The same insect, from the Cameroons, on the West Coast, resembling *Amauris egialea* in both sexes.

28. The same insect, from Natal in the south, resembling *A. dominicanus* in both sexes.

Lastly, we come to the subject of Courtship. Amongst human beings man selects his mate, and therefore it is only natural that the woman should be the most beautiful, and dress prettily and try and make herself charming in the eyes of man. But you must understand that with the lower animals the position is exactly reversed—the female selects her mate, it is she who

selects, and as she naturally selects the finest and most beautiful-looking male she can find—the male is almost always the more beautiful of the two; ill-shaped or ugly-looking males are out of it altogether and have no chance—and therefore the beauty of the male goes on increasing and improving, while the female in looks is more or less stationary. The male coquets and shows off his beauty to the admiring female, and tries to induce her to select him. I could tell you of birds and animals in which the female holds a regular court, and the males one after another coquet and dance around her, showing off their beauties to the best advantage; but time will not admit of my going into these matters. I will, however, show you one slide of a picture of the

29. Female bower bird in her garden. She is not beautiful to look at, but she makes up for it by building a bower when she wants to take a husband, and she picks off the prettiest flowers and leaves she can find and puts them all about in front of her bower to induce the males to come and coquet before her so that she may make her choice.

The courtship of spiders is also very wonderful, and I will finish by showing you a few slides concerning them.

30. The first slide represents a spider called *Saitis pulex*. A male was put into a box containing a matured female. He saw her as she stood perfectly still 12 in. away. Her glance seemed to attract him, and he moved towards her. When some 4 in. from her he stood still, and then began the most remarkable performances that an amorous male could offer to an admiring female. She eyed him eagerly, changing her position from time to time, so that he might be always in view while he danced around her. He would raise his body on one side, stick his legs under him on the other, and move around her in this extraordinary attitude, changing his legs constantly so as to have the side next to her always lifted, so as to display all his beauty.

31. The next slide shows another species of spider (*Hobrocestium splendens*), whose beauty lies in another direction, and consequently he makes love by displaying his charms in quite a different manner; and the next two slides, 32 and 33, show another spider (*Astia Vittata*), the males of which are of two different colours, and you will see each shows off his best colours in his own particular way.

The dangers of courtship are also sometimes witnessed. Sometimes the female had apparently something else to think of, and did not want to be courted by that particular male. A male of *Hosarius Luzi* continued his advances after the female had shown signs of impatience, when she seized him and held him by the head for a minute; he struggling at last got away and made off, having had more than enough of that sort of

love-making. The male of another species (*Phidippus Rufus*) offended the female he was showing off before, somehow or other, and, carrying his antics too far, the female seized him and killed him, and then ate him. This female must have been a regular savage monster, because two other males were given to her, and on their showing her the merest civilities she killed them both.

This closes my lecture in which I have made many extracts from Mr. Poulton's great lecture on Mimicry at Leeds, and I have to thank him for the loan of many of his slides for use at this lecture. I hope you all understand that I have merely been showing you some of the many extraordinary examples in Nature observed by careful observers, of whom I am but a humble follower. No one can lay down any law as to how these things have been brought about, because no one knows. All that can be done is to observe Nature closely, and to make deductions. That everything *is* changing every day our common sense tells us; that all nature is constantly working for the preservation and improvement of the life it contains is, I believe, true. The key and root of the whole theory of evolution is, no doubt, the great struggle for life that is and always has been going on in this world, and the more one observes and the more one thinks impresses one more and more with the fact of our own littleness, and with the wonders of the works of the great Creator.

NOTICES OF BOOKS.

The Buccaneers of America. A True Account of the Most Remarkable Assaults Committed of late Years upon the Coasts of the West Indies by the Buccaneers of Jamaica and Tortuga (both English and French). Wherein are contained more especially the Unparalleled Exploits of Sir Henry Morgan, our English Jamaican Hero, who Sacked Porto Bello, Burnt Panama, &c., by John Esquemeling, one of the Buccaneers, who was present at those Tragedies. Now Faithfully Rendered into English. With Facsimiles of all the Original Engravings. Introduction 36pp., and 508 pp. Index, Portraits, Views, Sketches, and Map. Price 15s. London: Swan, Sonnenschein and Co. 1893.

THIS is a new edition of Esquemeling's scarce book, and is well printed. The contents of the book are well known.

The story is a horrible one. It is difficult to decide whether most to admire the careless courage of these freebooters, or to detest their terrible cruelties.

It is striking to find them, after especially cruel conduct, thanking God for their wonderful preservation.

The story is full of horrors, but it is also exceedingly interesting as lifting the curtain on the terrible history of the early occupation of these Western lands, and the height to which national jealousy and hatred could be carried. We may be thankful that the Buccaneers are dead.

THE RIVER VALLEYS OF THE HIMALAYAS.

By Mr. R. D. OLDHAM, F.G.S., of the Geological Survey of India.

[Addressed to the Society, in the Memorial Hall, Wednesday, December 6th, 1893
at 7-30 p.m.]

IT has become one of the hackneyed paradoxes of the populariser of science, wishing to attract a little cheap astonishment at the cost of a small amount of originality, to maintain the inaccuracy of that old proverbial expression which regards the everlasting hills as a type of changeless antiquity. The design, however, no longer succeeds, for everyone now knows that the mountains, which impress man with their apparently immovable grandeur and changelessness, are in many cases affairs of but yesterday in the life of the globe, and that in the past there have been mighty mountain ranges which have now vanished or dwindled to insignificant hills. It is not, however, my purpose to expatiate on this hackneyed subject, or to justify, as might well be done, the old proverb, but to deal with what are often older than the hills, though not regarded as types of antiquity—the rivers that flow between and through them. Ever changing, at one time a raging torrent, at another a chain of sluggish pools, here cutting away its bank, there heaping up sediment, it can be no wonder that a river should never have been popularly accepted as a type of permanence. But just as man preserves his individuality though the substance of his body is ever being changed, and undergoes several complete renewals in the course of his lifetime, so rivers, though the water that flows in their channels is constantly changing and constantly being renewed, preserve their individuality and, born when the land first rose from the sea, have witnessed the gradual rise of the hills, through which they now flow in the valleys they have carved for themselves.

The antiquity of rivers has not, however, been one of uneventful changelessness; no sooner had different drainage systems been defined than the struggle between them began. Favoured or hindered by circumstances, by accidental differences of amount or distribution of rain, differences in the hardness of the rocks opposed to its attack, and by the manner in which

the gradual upheaval of the land affects the gradient of its bed, one river may invade the territory of another, forcing back the position of the watershed, and in some cases diverting whole tributaries from a rival drainage area to its own.

The study of the processes by which these changes take place, and of the consequences resulting from them, have been much less studied of late years by English geologists than by their rivals on the Continent and in America; yet the subject is one which possesses great interest and, when reduced to its elements, the effects are found to be entirely due to two fundamental principles which, in the ultimate resort, control the actions of a flowing stream. The one is that water will not stand on an uneven surface, but will flow off to the lowest levels, and in doing so will choose that course which is immediately easiest. Hence it comes that the bed of a stream will often make a long detour and return almost to its original position,* because at some previous stage of its history this happened to be the easiest outlet for the water, and having once established itself there is always a tendency to retain the old course, down which there is a continual descending gradient.

This may be called the law of permanence of river courses; the other may be called, but not quite so appropriately, the law of change. It is that—like anything else in nature—a flowing stream is always tending towards a condition of stability, which in this case means a state when it is neither compelled to attack its bed by the velocity to which the slope and shape of the channel impel it, nor is it prevented by the same circumstances from acquiring sufficient velocity to transport its solid burden. Until such a state of equilibrium is attained the stream will attack its bed whenever the velocity is in excess, and the vigour of this attack, and *ceteris paribus* the rate of erosion, will be proportionate to the excess. Now, the velocity of a stream is dependent on the gradient of the channel, and also to a great extent on the volume of the stream. A large stream will be able to acquire a given velocity on a gentler gradient than a small one, an effect which becomes important in the case of the very small streams at the heads of the valleys, and more especially in the rivulets which drain down the valley sides after rain.

A result of this influence, which volume has on the velocity of the current, is that where a stream is flowing at a considerable height above its final base level of equilibrium, we find that it flows in a narrow steep-sided valley, and that as the watershed is reached the slope rapidly increases. As the final condition of equilibrium is neared the deepening of the valley becomes less rapid; weathering and the action of the small rivulets of

* The windings of a river in an alluvial plain are not referred to, these being due to a different cause.

water on the hill side combine to open out and ease the slopes of the valley. But always a steepening of the gradient towards the watershed will be observed, and where this is wanting, it is clear proof that the head of the valley has been cut off, or robbed, by another stream cutting its valley backward.

Such cutting back of the head of the valley has repeatedly been observed and demonstrated, and in this way the whole course of a drainage has before now been altered. Sometimes where a river takes a long detour and returns to near its original position, some tributary stream, favoured by the more rapid gradient of its shorter course, may gradually obliterate the ridge which confines the river to its valley and divert the main current by a short cut down the course of what was once a tributary. More often, however, it will be one drainage area which encroaches on another and diverts part of the upper waters of the one into the channel of the other.

These are the general principles, so well established, so necessary, and supported by so many observations in different parts of the world, that there is no gainsaying them, and the following paper will be an attempt to apply them to the explanation of certain peculiarities shown by the drainage system of the Himalayas.

The maps of the Himalayas may be divided broadly into two classes, those that only show what is more or less known and those which, in addition, exhibit the ideas of the compiler regarding the orography of the unknown portions.

Of the latter, the production of Clements Markham, prefixed to his edition of the travels of Bogle and Manning, is a conspicuous example; three long, well-defined, and continuous ridges are depicted running along the length of the Himalayas in a more or less parallelism with each other. The idea embodied in the maps has a certain foundation in fact; the line of greatest elevation, as marked by the highest peaks, does not coincide with the main watershed between the southern drainage and that which only crosses the range after a longer or shorter course parallel to it. These constitute two of the supposed three ranges; the third runs parallel to and north of the Indus and Sanpo valleys. Here, too, it seems doubtful if there is any defined range, though the ground is of course more elevated than in the valleys of the two great rivers. The fact is that the structure of the Himalayas is a complex one; it cannot be regarded as a simple mountain range, or even as three parallel ranges, rather it is an aggregate of numerous smaller ranges of various sizes and degrees of pronouncedness.

Of the second class of maps a very favourable instance is the large map of India published by the Surveyor General. This, too, is in a way misleading, for all the southern slope of the

mountains, whose topography is more or less known, is fully drawn, while north of this in Thibet there are only a few outlines of rivers and lakes, and faintly sketched in hills, thus giving an appearance of much less relief. To a certain extent this is true. Thibet is a region of broad plains and open valleys, and the mountains, though high, are comparatively small, on account of the altitude of the bottoms of the valleys from which they rise. Still there is certainly not that absence of relief which a casual glance at the map might indicate.

Both classes, however, agree in their delineations of the broad features of the hydrography, for as regards this it is easier to obtain information, and one of the most striking points is the pair of great longitudinal valleys which run along the northern side of the main range, and finally break through it to escape on to the plains of India. In a north-westerly direction the Indus flows for about 600 miles through some of the loftiest mountains of the world till it turns south-westwards; while, not far from its source, the Sanpo river rises and flows at first east, and then east-south-east, till it too turns southwards, breaking through the eastern termination of the Himalayan range, to join and assume the name of, the Brahmaputra. The Sutlej too, rising in the immediate neighbourhood of the source of the Sanpo, flows to the north-west, and then, turning westwards near Shipki, flows by a deep valley through the snowy range to the plains.

But not less remarkable is the equally-known feature that the line of greatest elevation of the Himalayas does not coincide with the watershed between these longitudinal valleys and those of the numerous large rivers which flow more or less directly to the south, and sooner or later mingle their waters with those of the Indus or the Brahmaputra.

The Jehlam, Ravi, and Bias all break through high ranges, though in this terminal portion of the Himalayas there are higher peaks to the north and east of their drainage areas than those of the ridges they break through. Further east, in the median portion of the range, removed from the complications introduced by the junction of the Himalayas, Hindukush, and trans-Indus mountain systems, we find that the line of highest peaks lies to the south of the main watershed, and the rivers all drain, sometimes a larger, sometimes a smaller, area on the north of the line of maximum elevation. This has long been known, and various are the explanations that have been offered of the want of accordance that might be expected to exist between what appears to have been the axis of maximum elevation and what may be called the axis of the drainage system.

The earliest of these, that contained in the paper of General Strachey, written forty years ago,* is that the valleys cor-

* "Quart. Jour. Geol. Soc.," X., 249-253 (1854).

respond with great fissures or fractures, widened out by the rivers which flow through them. Though quite in accordance with the ideas prevailing at the time these papers were written, before the great power of rain and rivers was fully appreciated, the idea of attributing river gorges to fracture has become more or less discredited, as in instance after instance this explanation has been proved to be erroneous, and we may leave this explanation out of the question.

Another explanation that has been offered by von Richt-hofen* is, that the whole region north of the high peaks was once higher even than they are now, and that the line of greatest elevation originally corresponded with the present watershed; that the drainage system then originated, and that the present elevation of the peaks is due to their greater power of resisting denudation, while the softer rocks to the north were worn down. This explanation has been applied with great success to the explanation of the river valleys through the downs on either side of the Weald in the South of England, and in other places; but however true it is in these cases, there does not seem to be always such marked difference in the hardness of the rocks, composing the high peaks and those of the watershed range, as to account for the observed features, and it is difficult to believe that the highest peaks of the Himalayas were formerly overshadowed by a still higher range to the north.

A more probable explanation is that offered by the talented authors of the first edition of "The Manual of the Geology of India," that the features of the drainage were marked out long before the Himalayas attained anything like their present altitude, and that the rivers were able to maintain their courses transverse to the range by erosion of their beds *pari passu* with its elevation. The principal difficulty here is the comparatively small catchment area of many of the rivers to the north of the snowy range, and this was got over by supposing that they formerly extended further to the north, having been shortened by a gradual encroachment of the longitudinal valleys which, cutting back along the strike of the rocks, were able to divert the drainage into their courses. It must be remembered, however, that the gradients of these rivers, owing to their longer course, are lower than those of the rivers which have a more direct course to the southern margin of the range. This lesser gradient might be compensated by the existence of a zone of rocks much softer than are found to the south, and along part of the Indus valley in Ladakh such a band of soft tertiary rock does exist; but there does not seem to be any reason for supposing that there is such a general predominance of soft rocks along the whole course of the valleys, and it is difficult to see how the

* "Führer für Forschungsreisende," p. 175.

levels of these rivers, where they ultimately cross the axis of the range, could have been kept sufficiently lower than those of the other valleys to enable them to encroach and rob the drainage of the latter.

There is yet another hypothesis—that the original watershed did more or less accord with the line of maximum elevation as marked by the present line of highest peaks, but that the rivers which had a direct course to the plains have in many cases been able to cut back through it owing to their greater gradient. This is the explanation that I would propose; but, before entering into it more fully, it is necessary to sketch briefly what is known of the origin of the Himalayas.

There can be no doubt whatever that there was a time—and that not so very distant, geologically speaking—when the Himalayas were not. It is unnecessary to enter in detail into the grounds on which this conclusion is based, which are many, but the discovery of nummulites in the heart of the Himalayas, at an elevation of 20,000ft. and more, shows that, at the beginning of the tertiary era, the sea flowed where now these mountains stand, and that the very rocks of which they are composed were then only being formed. Yet, though the Himalayas did not exist in anything like their present form at the commencement of the tertiary era, there is ample evidence that, by the time its first half had elapsed, they stood up with much the same limits as at present, and with an elevation comparable—though probably not equal—to what they now have.

On the geological map of India a strip of tertiary rocks will be seen running along the outer or southern margin of the Himalayas, from one end to the other. To the north-west, where this strip expands in width, the lowest beds are of marine origin and nummulitic age; elsewhere these rocks are wanting, and only the miocene and pliocene periods are represented by beds of fresh-water and sub-aerial origin. The lower half, or thereabouts, of this fresh-water formation, known generally as the Siwalik series or system, consists of clays and fine grained sandstones, probably formed sub-aerially by the action of flowing streams. In this lower portion of the Siwalik series no conglomerates, and not even a trace of a pebble, are known with certainty as yet; and even if subsequent, more detailed, researches should detect some occasional occurrences of coarser grained deposits, it will remain true that the general lithological type of the group is fine grained sandstone alternating with clay.

In the upper group we find a different state of affairs. Here, too, the lower beds are for the most part composed of sand with small pebbles; but, where the larger rivers debouch from the inner hills, these sands pass upwards into a great thickness of coarse conglomerates, composed of well-rounded fragments of

hard quartzites and other crystalline or metamorphic rocks, whose shape and composition show that they have travelled a long journey down a rapid stream from the interior of the Himalayan Mountains. In the intermediate stretches, away from the present positions of the rivers, where the streams now only reach a short distance into the outer hills, these coarse conglomerates of large and well-rounded crystalline rocks are replaced by clays, sands, and conglomerate beds, in which the fragments are imperfectly rounded and composed of such *debris* as is still being brought down by the local streams from the outer hills of the main mass of the Himalayas.

The particulars on which these general statements are based need not be detailed here, as they are given at length in the "Manual of the Geology of India" and in various other publications of the Indian Geological Survey.* The facts are well established and generally recognised, and from them we may conclude that at the commencement of the tertiary era the Himalayas did not exist in anything like their present form or proportions; that during the first half they grew in elevation, and that at the period when the conglomerates of the upper Siwalik series were being deposited and the great Siwalik fauna still lived—a time which is now regarded as corresponding to the pliocene period of European geology—the Himalayas existed as a mountain range with the main features of its hydrography already marked out. The drainage of the interior of the hills was even then carried off by the same great rivers, which issued at the same places as now; and these rivers were rapid torrents capable of carrying along large boulders, whose hardness and well-rounded forms speak for the distance they have travelled, and the wear they have undergone. The great thickness and coarse texture of these conglomerates argue a rapidity of current in the rivers which necessitates their having drained from lofty mountains; but we can derive no direct evidence from the conglomerates as to whether they were loftier or less lofty than at the present day. So, too, though we can fix the points at which the rivers left the hills, we can draw no conclusions as to the exact position of the watershed from these conglomerates alone, and if we would determine whether any or, if any, what changes have taken place in its position, we must take into consideration another line of argument, based on those fundamental principles which were referred to in the early part of this paper.

The question, then, is whether the longitudinal valleys of the Sutlej and the Sanpo have cut back their head waters and robbed the drainage areas of the transverse river valleys, or

* See in particular, H. B. Medlicott, "Memoirs Geol. Surv. Ind.," III., pt. ii, 1-206 (1864). "Records Geol. Surv., Ind.," IX., 49-57, (1876). Also "Manual of the Geology of India," 1st Ed. (1879). 2nd Ed., pp. 468-470 (1893).

whether it is these transverse rivers which have given a more direct outlet to a portion of the drainage, which once flowed by a more circuitous route to the alluvial plains of the Indo-Gangetic rivers.

No observations have been made near the head waters of the two drainage systems with a view to settling the question. Such geologists as have visited the passes appear to have confined their attention to the solid geology, while the accounts of non-scientific travellers are too indefinite to yield any decisive facts, and in the whole range of the literature I have been able to find but one specific observation pointing to a change in the position of the watershed. According to General Strachey,* the sub-recent gravels of the upper Sutlej valley extend right up to the crest of the Niti Pass, and a detached portion is to be found some two miles south of the watershed. That these deposits should extend right up to the crest of the pass is in itself proof that the valley, down which they must have come, formerly extended south of the present watershed, and the detached portion of the gravels only gives a superfluous corroboration of the conclusion that there has been a northward recession of the divide, and a robbing of the Sutlej drainage by the Dhaulī river.

From this we see that, in one case at least, there has been a movement of the divide towards the north, and apart from it the general features of the surface contour, north and south of the main watershed, point to the same conclusion. The approach to the passes from the south is in every case by deep cut valleys, on either side of which the mountains rise steeply for several thousand feet, and finally there is a long and steep ascent to the actual crest. On the northern side the descent is much less, and there may even be no perceptible descent at all, but the traveller arrives at once into a gently sloping river valley, whose size and gradient show that it must once have been occupied by a much larger body of water than the puny stream which now flows in it.

The best known, and probably the most conspicuous, instance of this is the Zoji La, on the road from Cashmere to Leh, separating the drainage area of Jhelum from that of the Indus. The ascent from the Sind valley on the south is steep and rapid, by a valley so deep cut and narrow that it is blocked by snow throughout the winter and well on into the summer, long after the crest of the pass is free. From the head of this ascent there opens out a valley, partially filled by talus fans and rain-wash from its sides, along which the road runs on what seems to be a level, and the first indication that the watershed has been passed is the appearance of a small stream flowing northwards. Here

* Journal of the Royal Geographical Society, xxi., 63 (1851).

the whole of the steeper slope at the head of the valley has been cut off by the gradual encroachment of the Sind river. I do not know that it is possible now to determine where the divide originally lay, but a considerable area, whose rainfall once fed the Indus, now drains into the Sind, thereby increasing the power of its attack on the divide, and diminishing that of the Gamber to deepen its channel and so resist this encroachment.

In the passes north of Kumaon and Garhwal the same thing may be observed. South of the divide there are deep cut valleys and gorges, with steep or precipitous slopes at their heads. North of the divide the valleys, on the contrary, have gentler slopes, are wider and more open, and generally show signs of

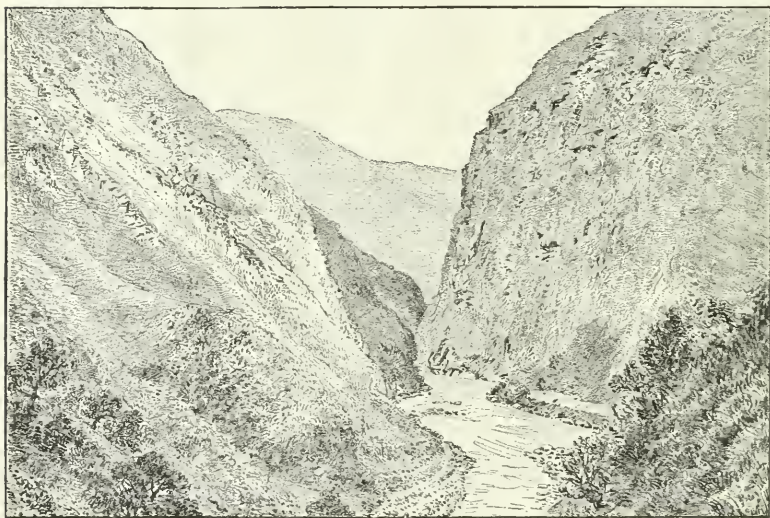


FIG. 1.—BIAS VALLEY NEAR LARJI KULU.

(From a photograph by Bourne and Shepherd.)

having been made by larger streams than now occupy them. The views that I throw on the screen of the scenery south of the passes are sufficient proof of the accuracy of my statements regarding the nature of the valleys, while the reproduction in Fig. 2 of the admirable sketch of my colleague, Mr. C. L. Griesbach, shows the great change of general features met with as soon as the passes are crossed. Moreover, the admirable maps of northern Kumaon, published by the Trigonometrical Survey of India, have enabled me to construct sections across some of the passes which show most strikingly the difference between the gradients on the northern and southern sides of the divide. This is very conspicuous in what may be called the Chitichun group of

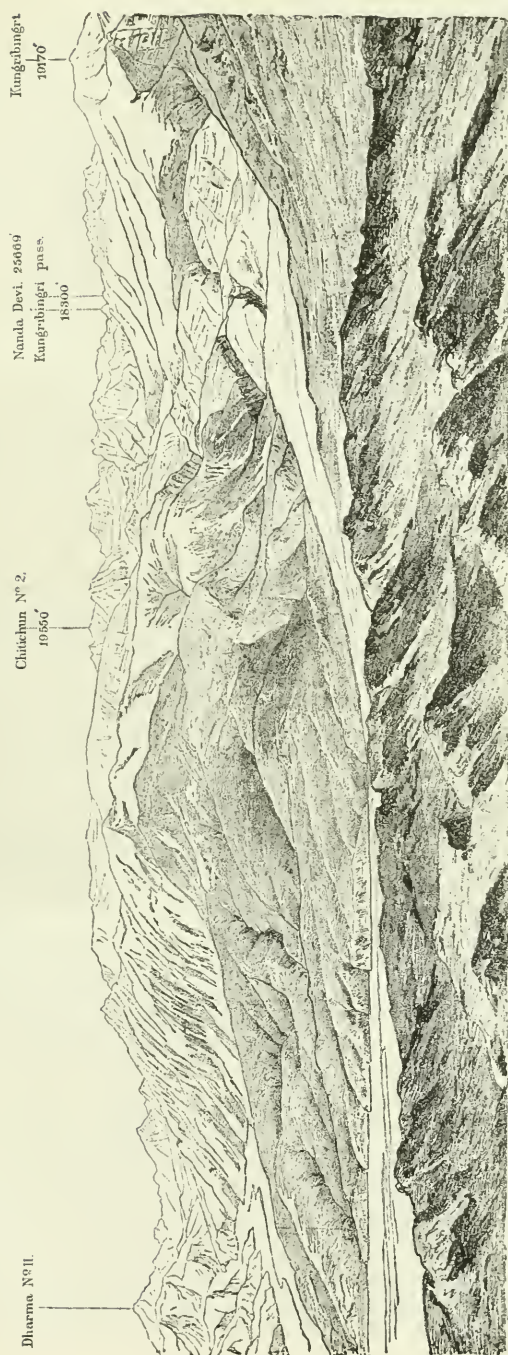


FIG. 2.—PROFILE OF THE KUNGRIBINGRI AND DHARMA PASSES FROM CHITICHUN No. 1 PEAK. After C. L. Griesbach. *Records Geological Surv. Ind.*, XXVI., pt. 1 (1893).

passes. In figure 3 I have combined the sections on three passes at the head of the Kiogadh, in each case the section starts and ends at the same point, and the actual horizontal distance is so nearly the identical that no appreciable error is introduced by making it the same, as has been done for convenience. The great steepness on the southern face is very conspicuous, and the diagrammatic indication of the heights of the mountains bounding the valley shows clearly how the watershed does not coincide with the line of greatest elevation. Here there is obviously a much more active erosion going on on the south than on the north, and the original position of the divide probably lay ten miles to the south of the present. This Chitichun group of passes may be regarded as a typical one, where all the features generally recognisable are exceptionally emphasized; but in a lesser degree they may be recognised everywhere, and the section be regarded as a somewhat exaggerated or diagrammatic form of the normal or average nature of the section across the Kumaon passes.

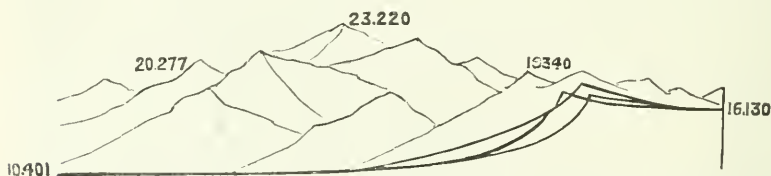


FIG. 3.—SECTIONS ACROSS THE CHITICHUN AND OTHER PASSES AT THE HEAD OF THE KIOGUDH IN KUMAON.

Horizontal scale 8 miles = 1 inch. Vertical scale = horizontal $\times 2\frac{1}{2}$.

Everywhere the greater steepness on the south is very noticeable, and from it we may conclude that a recession of the watershed, which is geologically speaking rapid, is in progress. In the geologically recent past this must have been even more rapid, for not only does every increase in the length of the southward flowing streams diminish their gradient, and so lessen their power of erosion, but it seems probable that the latest stage in the history of the northerly flowing streams has witnessed some increase in their power of erosion and of resistance to the recession of the divide.

The upper Sutlej valley is occupied by a great accumulation of sub-recent deposits which have been cut into by river gorges to a depth of some 2,000ft. Whether these deposits are mainly lacustrine or alluvial is as yet unknown, but, however this may be, it must be obvious that while they were still intact the gradient of the northward flowing streams must have been less than is now the case, when they find their outlet into the Sutlej at a depth of 2,000ft. below the old surface, and it may be that the increase of gradient so obtained has been sufficient to enable

the streams to erode the upper portions of their channels and to assist the passive resistance of the mountains themselves to a change in the position of the watershed.

The whole range of the Himalayas east of Kumaon is not only unexplored, but inaccessible, except in Sikkim; we may, however, conclude that the features so universally seen in the accessible portion of the range are not confined to it, but that everywhere there has been in the past, and is still in the present, an encroachment of the southern on the northern drainage area.

The question then naturally arises, of where was the original position of the watershed, and the equally natural answer is that it may be looked for in that region, which the altitudes of the peaks and the antiquity of the rocks alike indicate as the one in which the elevatory forces reached their maximum intensity. It is probable that along this line the future mountain range first began to rise, and that in the earlier stages the streams flowed off north and south from a central divide. The northern drainage collected in rivers, which ultimately flowed across what subsequently became the mountain system of the Himalayas; and these rivers, owing to the size and power they possessed, in virtue of their extensive catchment area, were able to maintain their course through the rising mountains, by cutting away the barrier as it gradually rose across their channels.

The struggle, however, was not without its vicissitudes; at times and in places the elevation was more rapid than the rivers could altogether master, and extensive alluvial deposits or even lakes have been formed. In the latter stages of the struggle movements of elevation have probably been more rapid than at first, and the rivers have been put at a further disadvantage by a cause which has not yet been referred to.

While the Himalayas had still but a moderate elevation there is no reason to suppose that there was any marked difference between the rainfall on the northern and the southern slopes, but as the crest of the range rose, a larger and larger proportion of the moisture was cut off, till at the present day nearly the whole of the summer rainfall is taken by the southern slopes. In this way the power of the streams flowing directly southwards has been much increased at the expense of those which drain the northern slopes. The effect of this has been most marked. Over the greater part of Thibet the rivers have been completely mastered, and are no longer able to maintain their course to the sea. The Indus river has lost one long and important branch which formerly flowed from east of Rudok down the valley now occupied by the Pangong lakes to join the Shyok river, while in the main valley the extensive spreads of alluvial, and frequent occurrence of lacustrine, deposits show clearly enough how its gradient has been checked by a rising of

the river bed, which could not be immediately met and conquered by the erosive power of the stream.

In the Sutlej valley there is an especially striking instance of the struggle that has gone on between the forces which have uplifted the range on the one hand, and those which have cut out the valleys on the other. Here the former had for a long time the mastery, and the whole of the upper Sutlej valley in Hundes is now occupied by the great accumulation of sub-recent deposits, reaching a thickness of 2,000ft., which has already been referred to. At a later period the river again acquired a mastery, and cutting down its gorge through the Himalayas has been able to re-excavate the deposits of an earlier date.

We find, then, ample indications of the difficulty that the Sutlej and the Indus have had in preserving their course across the Himalayan range, and though we have no detailed information regarding the other rivers further east, which similarly collect the drainage of the northern slopes and carry it through the range, it is natural to suppose that the conditions are much the same. The opposition which the rivers have met with in maintaining their course across the range has rendered it impossible for them to encroach on the southern drainage, and we may conclude that there has nowhere been a cutting off of the head waters of streams which once flowed from the north across the range, by a growth of the longitudinal valleys running parallel to the range north of the zone of highest peaks; on the other hand, whatever shifting of the watershed there may have been was in a northerly direction, and where one river has captured part of the drainage of another, it is the one which flows directly southward which has encroached upon the one which gathers the drainage of the northern slopes, before breaking through the range. This robbery has been due to the decreasing power of the northern drainage, owing to the lesser average gradient of the stream-beds and the diminished water supply; while not only did the gradient of those streams whose course is more directly to the south increase in greater ratio as the mountain range grew in height, but the volume of water flowing in them increased as a larger and larger proportion of moisture was extracted from the monsoon winds by the rising mountain range.

But though this explanation holds good in many cases where there is a comparatively small catchment area up stream of the gaps through the line of highest peaks, it can hardly apply in the case of those rivers which drain large areas in the high lands to the north.

The Indus and the Sanpo or Brahmaputra, each of which runs parallel to the range for half its length,* before turning to cross

* It is probable that the original form of their drainage area was less peculiar than the existing one; doubtless both had several large tributaries flowing from the north, which have been cut off by the drying up of the country—or may exist but have not been explored.

it on their way to the plains of India, are doubtless instances of what is known as antecedent drainage—that is, the rivers are older than the mountain range; so, too, the Sutlej, Gogra, Kosi, and the Subansiri, which have large catchment areas north of the line of highest peaks, are probably older than the range, and have been powerful enough to maintain their courses across it. But the numerous cases, similar to those which have been specifically referred to, where the catchment area is not sufficiently large to allow of this explanation, seem to be due to the cutting back of the heads of the valleys by the more vigorous erosive action of the streams that occupy them.

I cannot leave this subject without pointing out how similar are the features presented by the Himalayan to those, on a smaller scale, by the Alpine passes. The features of the Zoji La are repeated in the Maloya Pass at the head of the Inn valley; in both cases the pass is the lowest in the range, and this lowness is due to the complete obliteration of the steeper slopes at the head of the northern drainage. The other passes show the same contrast between the southern and the northern slopes as the Himalayan ones, and the explanation is the same—a more rapid erosion of the southern valleys owing to the greater gradient and heavier rainfall; and finally, to this recession of the heads of the southern valleys is due the fact that the highest peaks are not found along the line of the watershed, but frequently on spurs projecting from it into the southern drainage area.

The conditions in the two regions are in many ways very similar, but the features are developed on a much grander scale in the Himalayas; and now that mountaineering in the Himalayas is growing in popularity, we may hope that some of those who devote themselves to the pursuit may be induced to pay a little attention to the very interesting subject I have attempted to deal with, and to fill up the gaps in the present state of our knowledge with those accurate observations, on which a satisfactory theory can alone be founded.

NOTICES OF BOOKS.

Bulletin de la Société Neuchateloise de Géographie. Tome VII. 1892-3.

This is a most interesting volume. The papers on Lorenzo Marques, the Limpopo and Districts; Nicaragua, on the oldest known Map of the Country of Neuchatel, the Discovery of Australia, are illustrated with a large number of maps and diagrams, and makes this a very valuable record.

THE VOYAGES OF COLUMBUS.

By MAJOR R. F. BALLANTINE.

(See Map.)

[Read to the Members, at "Old America," Royal Botanical Gardens, Wednesday, July 27th, 1892, and at the Cheetham Town Hall, Wednesday, Oct. 19th, 1892.]

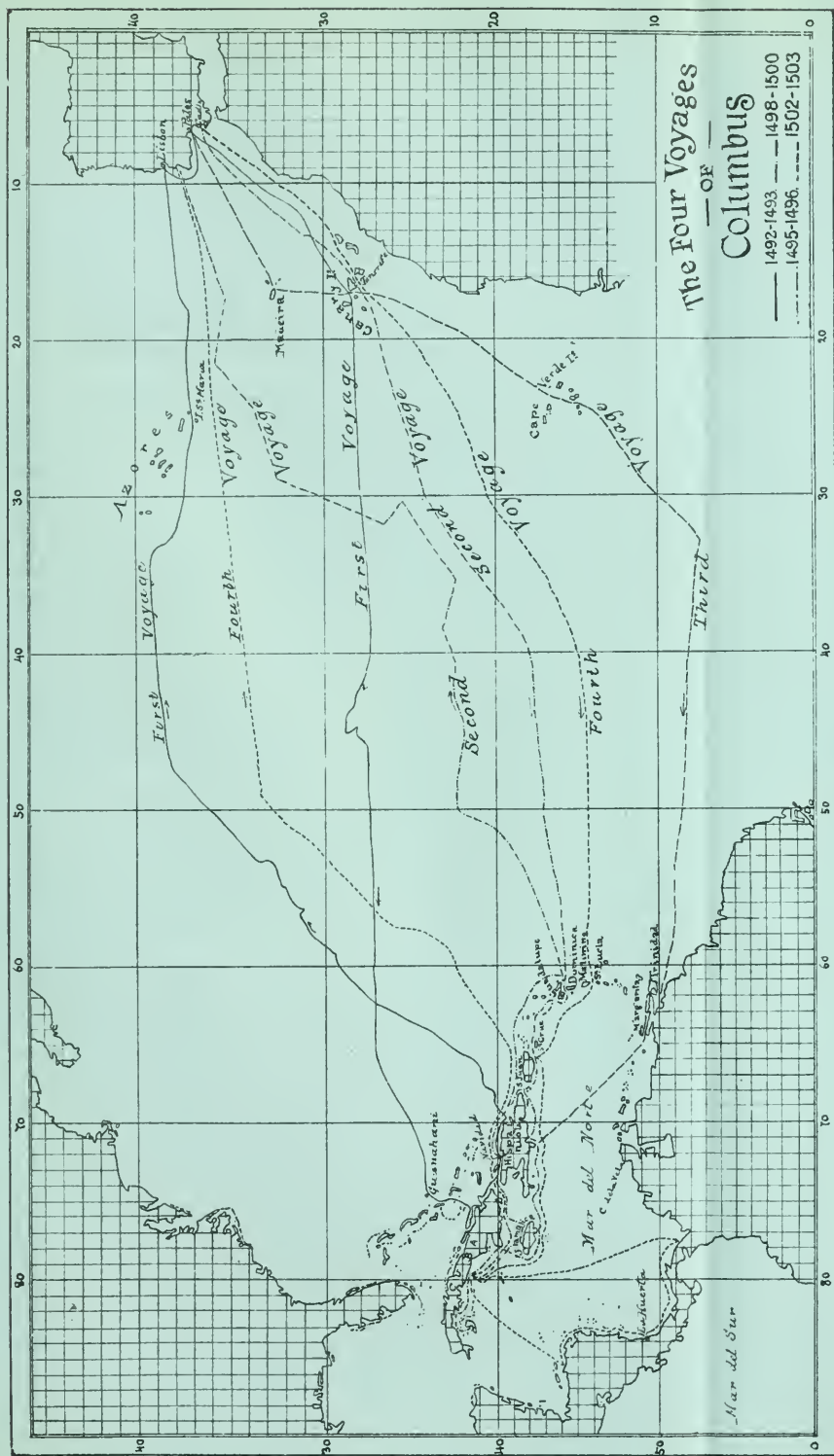
ON the 17th April, 1492, the agreement between the King of Aragon and Columbus was signed, the Queen of Castile finding 67,500 dollars, the town of Palos, the rent of two fully-equipped caravels for two months, some amount from Santangel and Columbus, neither of which were probably ever found. But the conditions of the admiral were agreed to.

At an end was his weary waiting on Portugal, the treachery of His Portuguese Majesty, his negotiations with France and England through his brother Bartholomew, his heart-aching delay until Granada should be taken, and the quibbling and mean opposition of those who did not want so great an enterprise to be entrusted to a foreigner, who, if they were convinced his theories were sound, managed to disguise that belief, making obstacles and almost inducing Ferdinand to refuse the offers of Columbus. The Rabida friar, true as steel, with the Queen's confessor, aided by the unanswerable arguments of the navigator, and perhaps fortified greatly with Toscanelli's map and letters, held the Queen firmly to her promise, and at length the promise was fulfilled by the aid of the Queen's splendid generosity and faith, and the admiral joyfully took his way to Palos to make the necessary arrangements for the voyage.

The people of Palos were not enthusiastic in the project. "Dismay was felt at the prospect of launching out for such a voyage upon the sea of darkness, and groans and curses greeted the announcement of the forced contributions."* The brothers Pinzon, however, believed in the project, and were hearty and active in their support. Any man enlisting in the expedition had his debts forgiven, civil actions were suspended, and criminals freed from jail. We should be glad if we could know if the croakers on the ships were these same criminals.

Three caravels were impressed into the service of the Crown for an unlimited time (showing on the part of the Crown rare generosity with other people's goods), the rent of two of them for two months being paid by the town. These caravels were: first, The Santa Maria, or Capitana, belonging to Juan de la Cosa, a Biscayan mariner. He commanded her and had for pilot Sancho Ruiz. She was a single-decked vessel, about ninety feet in length by twenty feet breadth of beam and ten and a half in depth. The Santa Maria was the Admiral's flag-ship. The second, The Pinta, belonged to two citizens of Palos, Gomez Rascon and Cristobal Quintero, who went in the ship sulky and ready for mischief. The Pinta was commanded by Martin Pinzon, and was a much swifter ship than the flag-ship. The third, The Niña (or Baby) was commanded by Vicente Yañez Pinzon, a man about thirty years of age. The Pinta and the Niña were not decked amidships. The other ships were much smaller than the flag-ship, and the whole of the crews numbered about ninety people, among them being one man called Lake "Lajes," an Englishman, and another one called Rice "Ires," a Galway Irishman.

* Fiske.



Bernhard V Darbshire J.R.G.S.

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SKETCH OF THE FOUR VOYAGES OF COLUMBUS

to illustrate the address by Major Balantine.

The vessels set sail, an hour before sunrise, on Friday, August 3rd, 1492, the faithful Prior of Rabida giving his blessing to the fleet. By sunset they had run due south forty-five geographical miles, when they shifted their course for the Canaries. A new invention on the *Pinta*, a rudder in place of the two lateral paddles for steering, having broken, gave Columbus some uneasiness, as he thought it was a trick of the owners to avoid the voyage, but the energetic Pinzon made the matter right, and passing Teneriffe, which was in flames, an awful omen of evil to the crews, at last the fleet collected at Gomera; having made needful repairs, they left that island on the 6th of September. For the next 25° the course was almost due west, with a little southerning. On the 8th, having been becalmed, they had only made about thirty miles. The next day they lost sight of Ferro, the last of the Canaries, with a strong breeze, amid the lamentations, cries, and tears of the sailors, who now gave themselves up as lost.

Had all the men been of the stuff of Columbus and the Pinzons the hazard of the voyage was enough, but with such a body of childish, timid, frightened men the risks were greatly increased. No man can tell what a coward will venture to do in a panic. Columbus dealt with them as with children, entering in his journal or log from day to day the distance run, and telling his crew another story. They ran 180 miles in twenty-four hours on the 10th September, and he reported 144 miles; the next day's run was 120 miles, and he reported it as 108. If he had not done this it is very likely that in October the mutineers would have killed Columbus and have returned. The weather was fine and the voyage prosperous.

At nightfall, on September 13th, the ships crossed the line of no magnetic variation, and Columbus was himself astonished to find the compass-needle swaying to the left of the pole-star instead of pointing a little to the right, and that this aberration daily increased. The pilots also saw this, and the crews were struck with consternation, but Columbus giving a profound and doubtless meaningless explanation, the terror for the time was abated.

On the 16th September the crews were again thrown into a state of great alarm. The ships ran into vast meadows of floating seaweeds and grasses, abounding in tunny fish and crabs. They were now more than 800 miles from Ferro.

The wonderful Sargasso Sea in Mid-Atlantic, covering a surface six times as large as France, with vast tangles of vegetation, furnished with an untold wealth of fish and having a depth of 2,000 fathoms, looked to the mariners like a green paradise, through which for a day or two the ships made their way. After some time the wind fell light and their progress was impeded.

The pilots were afraid they might run on shoals, but were pacified when on sounding they could find no bottom; imagination and fear ran riot amongst the crews, who revived all the fables they had heard of impassable seas and moveless ships. However, on the 22nd September, the journal reports "no more grass," and once more, at 1,400 miles west of the Canaries, they were in clear water. The fleet was now in the steady western trade winds, and the mariners began to question if they would ever be able to return, but whilst this discussion was at its height the wind suddenly blew from the south and dissipated their fears.

By the 25th of September the crews had become impatient at not finding land and somebody [was it a released convict?] suggested that if, when Columbus was stargazing, somebody pushed him overboard they would be well rid of him. But his superior knowledge, and the feeling that without him they might not find their way back, held them in check. And on this day some atmospheric phenomena or illusion appeared to give signs of land, at which the unstable crew sang songs of praise. Flights of strange birds and flotsam gave further indications, but they still

sailed on, and their depression was the greater from the disappearing mirage of the sea.

On the 4th October there was almost open mutiny, and Columbus boldly altered the day's run from 189 to 138 miles. His pilots begged him to change his course; urging that they might have passed between islands.

On the 7th October, at sunrise, they had come from the Canaries 2,200 miles—really they had run 2,724. Probably in stating the distance from Spain to Cipango at 700 leagues, Columbus had shortened that which he believed to be the true distance. He might think as he had now come more than 2,500 miles he might be passing to the north of Cipango, and so he shifted his course two points to west-south-west. This was a fortunate decision, for it soon brought his voyage to an end; he had but 505 miles more to sail to his objective, whereas if he had kept on he must have landed in Florida, which would probably have given North America to Spain instead of to France, Holland, and England. But the temper of the sailors of his fleet was becoming day by day more dangerous.

On the 11th October the signs of land became unmistakable, and now great excitement prevailed. The admiral promised 10,000 maravedis to the one who should first see land; the promise did not amount to much to the crews as the Admiral saw, or said he saw; it first and duly pocketed the maravedis. A few hours later, a sailor on the *Pinta* did undoubtedly see, about five miles away, a long low coast, and probably his were the first European eyes who first saw the shores of the New World—ten weeks from leaving Palos, thirty-three days since losing sight of Ferro.

On Friday, October 12th, 1492, the ships' sails were taken in, and they lay to until morning. And in the morning, amid the rejoicing of the crews, and the astonishment of the natives at the advent of these ship sea-monsters, Columbus landed on Watling Island. So far as the voyage was concerned this is the legitimate end of it, but Columbus wanted to find Marco Polo's rich cities of Cipango (Japan), and here they were not. He sailed away in the direction pointed out by the natives as the place from whence their gold came, and arrived on the northern coast of Cuba.

On the 20th November Pinzon's ship was not to be seen. He had intended to be first home with the news, but subsequently rejoined Columbus. The mariners now made Hayti, and as here the natives spoke of "*Cibao*," he thought this must be the island he sought. He was getting quite confused, and he died believing that Cuba was a part of the Indies, or rather of Cathay.

On the 25th December the *Santa Maria* was wrecked, and the *Niña* was now the only craft left to the admiral for his return. He must return to Spain; he must protect himself from Pinzon's designs if they were dishonest; further expeditions would be easy now the way had been shown. But what must be done with the crews? Forty men, who hoped to live in luxury on the labour of the natives, elected to stay behind, and the first settlement, that of Navidad, was founded, and on the 4th January, 1493, the rest of the party set sail on board the *Niña*. Two days later, off the north coast of Hispaniola, they found Pinzon, who now kept company with them on their return. He had a partially disabled ship and could not help himself. Owing to the westerly trade winds, Columbus steered north and then east, expecting to make the Azores.

On the 12th February, a terrible storm broke over the ships, which lasted for four days. The ships were separated again and did not meet again at sea. The next time they came together was in the harbour of Palos.

On the abatement of the storm, on the 18th February, the *Niña* brought to at the Island of St. Mary, when they were very scurvily received by the Portuguese governor, and it was only upon threats by the Admiral that the governor released

some of the crew, whom he had put in prison on their landing from the ship. Having got away Columbus made towards Cape St. Vincent. Another storm arose when the ship was about 400 miles away, and the storm was so severe that the little cockle boat was glad to run into the Tagus for shelter. Here his old master learnt that Columbus had accomplished his task to the honour and profit of Spain. And it is very probable that if Portugal had felt itself strong enough to quarrel with Spain, an end would have been made of the Admiral there and then. This not being so, a mask of friendship was assumed, and the Admiral was fêted instead of being stabbed.

On the 13th March he again set sail, and arrived at Palos on the 15th. Towards evening the *Pinta* sailed into the harbour. The storm had driven the *Pinta* to Bayonne, and from thence Pinzon had sent despatches to Ferdinand and Isabella, announcing the discoveries and taking to himself a considerable share of the glory. Before his letters to the Court could be answered, the letters and papers of the Admiral had come to hand. The reply to Pinzon was hard, cold, and stern; he slunk out of sight, and died a few days afterwards.

Columbus was royally treated; he was summoned to Barcelona, and for a few days perhaps enjoyed the greatest triumph of his life. But, although his sovereign gave him all honour and he was surrounded by his faithful friends, the hostility of the Spanish nobility was the more heated, and the more he was honoured and trusted, the more heartily did they hate this ambitious and successful foreign navigator and Lord of the Indies.

Columbus made three more voyages, all in very greatly altered circumstances. He was governor of the Indies, but we cannot help thinking he made a better navigator than governor. And in these days we can sympathise with Isabella in her hostility to Columbus for his traffic in slaves, rather than with the admiral who began the traffic, although we may not admire the queen's reasons.

There was no difficulty in obtaining ships and men for the second voyage of Columbus. This was not merely a voyage of discovery, but was to lead to the foundation of places of strength and the assuring of new-found lands to the Spanish Crown. Debtors and criminals were not invited to form this company. 1,500, and not 90, were included in this party; cavalier and priest, hidalgo and artizan, soldier and sailor—all formed a portion of the company.

On the 25th September, 1493, the fleet sailed, consisting of three great carracks, with lesser caravels and light craft, fitted for exploration.

On the 1st of October the fleet reached the Gran Canaria, where they waited to repair a leaky ship. On the 5th they anchored at Gomera, and took in wood, water, domestic animals, and seeds, and on the 7th the fleet sailed. By the 13th they were beyond Ferro. They took a more southerly course than in the last voyage so as to strike, if possible, the islands they had heard so much of to the south-east in the last voyage. In ten days they had passed the longitude of the Sargasso Sea, leaving it to the north, and encountered tempests, but were cheered by St. Elmo's fires playing on their masts. Water was, however, getting low, and the seamen were tired with baling out the leaky ships.

The leaders took counsel on the 2nd November, and thought they had come 780 or 800 leagues from Ferro. Columbus saw certain signs of land and signalled the ships to take in sail. They waited the night and in the morning saw the peaks of the Island of Dominica. Leaving a ship to look for a good anchorage, he passed on to another island, naming it after his ship *Marie Galante*, where he landed, setting up the royal banner in token of possession of the six islands he had seen.

The next morning Columbus discovered the wonderful volcanic cone of Guadaloupe,

a name given in accordance with his promise to the monks of Our Lady of Guadalupe, in Estremadura, to place their name in this strange world. And here they found the first signs of cannibalism. He took some captives, who told him the mainland was to the south, but he left the island, not having done more than confirming their suspicion, and in finding it a land full of verdure and of natural wonders. He passed several islands, and landed on the 14th at one he named Santa Cruz, and here they had their first fight with the terrible Caribs. Passing thence through a group of wild and craggy islets, he named them The Eleven Thousand Virgins. He then found Porto Rico (which he named San Juan Baptista), and two days later he steered for the settlement of La Navidad.

At Monte Christo they found gold in the river and the body of a man with a beard, and they feared for those they had left. When they came to the settlement they fired cannon, but there was no reply, to find later that the whole of them had fallen in feud with the natives. They abandon La Navidad, and seek and find a bay, protected by a jutting promontory, with two rivers running into it, and there they founded the town of Isabella. It was discovered that the Cibao gold mines were in the mountains, and Ojeda is sent to seek for them. Great reports of the gold found were sent to the king and queen in a letter by Columbus, which raised great hopes and led to much future disappointment.

The fleet returned on February 2nd, 1494. During his stay here he sails to Jamaica, through the Queen's Gardens to the Gulf of Xagua, and, finding the south-westerly point of Cuba, believes he has seen the Golden Chersonesus. At St. Philip's Keys he turns back, having forced all his men to swear that the land found was Asia, that Cuba was a continent and part of the country of the Grand Khan.

On the 10th March, 1496, he sails for Spain with Prince Caonabo. The Admiral was graciously received, but he had raised hopes which could not help but end badly, as it turned out.

In the third voyage he was taken by the governor left in charge and sent a prisoner in chains, and on his fourth and last he was forbidden to touch at Hispaniola at all. He coasted along the whole of the north coast of South America from the mouths of the Orinoco to Panama, and along central America northward to a point in Honduras, crossing his previous voyages, and finding a few more small islands, and yet just missing by a hair's breadth the discovery that he had found a "new land," The Indies he had sought, the Indies he had found, and the West Indies they still remain.

At the close of his last voyage, weary and worn with strife—Fonseco, his greatest enemy, triumphant; the queen dead; his rights guaranteed by the act of the Spanish Crown, and by that shabby Crown refused him—he made one more effort to set matters right for his heirs, but died in a humble house on his way—a house which, if it has not tumbled down, is now used for a corn store. The Crown tried to avoid its obligations to his heirs, but had at length to yield, though with very little fruit, since the lands have all (except Cuba) passed out of Spanish hands.

Four hundred years afterwards a great celebration of Columbus's landing in America is held in Spain, but nothing that can be done will efface the judgment which must be passed upon them for their scurvy treatment of the most distinguished navigator (an Italian truly) they ever had amongst them, and who, in return for a new world, reaped in his lifetime mainly insult and injury.

[See addresses by the Rev. S. A. Steinthal and the Chevalier Froehlich in the *Journal*, vol. viii., pp. 129, 137.]

A PROPOSED VISIT OF EXPLORATION TO VAIGATZ ISLAND (NOVAYA ZEMBLA).

BY AUBYN TREVOR-BATTYE, B.A., F.L.S., F.Z.S., Member of the British Ornithologists Union.

[Read at the British Association, Nottingham, and to the Society, Wednesday, October 18th, 1893.]

At the time of writing this paper I am far away from libraries and books of reference. I am, therefore, under the disadvantage of being unable to give literal quotations from authorities originally consulted. Nor can I hope to make a prospectus which shall be at all exhaustive of data—often most interesting and most important—which books and museums at home would have supplied. But if I may content those who are kind enough to listen with a *general* view of this question, as it presents itself to me, I venture to believe that it will be conceded that I have grounds for my belief that a careful exploration of Vaigatz Island bids fair to lead to results of an exceedingly interesting character. I may further say that while on the one hand I have preferred to omit all reference to many points of real interest rather than to risk inaccurate statement; so, on the other, it will, I believe, be found that I have committed myself to no statement of fact that cannot be verified in the proper quarter.

Vaigatz, Vaygatz, Waigats, Waigatch, or Waigatsch, is the southernmost island of the Novaya Zembla group. It lies on the 70th parallel, and is 59° east of Greenwich. It is about 100 English miles long by some 30 miles, more or less, broad. On the west of Vaigatz lies the Murman Sea (to use the name rescued by Nordenskiöld, from the old Russian maps); on the east the Kara Sea; north of it runs the wide strait known as the Kara Port; south of it the Yugor Schar, or Vaigatz Straits which are, at their narrowest, not more than five miles across, and separate the island from the mainland of Arctic Russia.

Vaigatz Island may therefore be very fairly termed *the key of the Kara Sea*; for it is only under very exceptional conditions of ice that a vessel would be compelled to make the passage of the Mathysin Schar between the two main islands of Novaya Zembla, while the way past the extreme north of these islands is a last resort that may in this paper be altogether neglected. But, owing to the crescentic shape of the group of islands, and to the horseshoe form they describe when taken in conjunction with the mainland, this, the south-west corner of the Kara Sea, is blocked with ice long after the Murman Sea on the west is easily navigable, with the exception, perhaps, of that part between the west coast of Vaigatz and the mainland, where a good deal of ice is often driven backwards and forwards until late in the summer. From the depth of the sea on its north-west, from geological conditions and types of flora (so far as they are at present known), we may fairly assume that not only the present but the past—the palæontological affinities of Vaigatz—are with the mainland rather than with Novaya Zembla itself. We are right, no doubt, in regarding Vaigatz as a separated bit of the Pae-choj Peninsula—as the last spur of the Ural mountains.

Vaigatz is visited during summer by the Samoyeds, who take their reindeer there for pasture, and it seems probable that a few of them may remain there during the

winter. But in an ordinary way they cross over on the ice at the end of May, and return to the mainland at the end of August, when the cold sets in.

I do not know that there is any record of a western European having ever visited the interior of this island, though it is probable that for very many years small traders from such towns as Pastosersk, on the Petchora, and Obdorsk, on the Ob, have found their way there for the purposes of barter with the Samoyeds in the summer.

And now a word as to the special interest in the Vaigatz from an ethnological and anthropological point of view. Vaigatz shares with the Yalmal Peninsula the distinction of being a sacred place. Vaigatz has been—and for how long no one knows—the sacred and *sacrificial island* of the Samoyeds. Here is set up one of those central objects of their worship of which but two are known to exist. Of these rough columns, one is believed to be on Yalmal, the other on the Island of Vaigatz. But on these matters we have little certain information. Such little as is known is to a great extent wrapped round with the quaint and not always reliable conclusions of early voyagers, more particularly of those engaged in the first and second Dutch expeditions of the sixteenth century.

Enough has, however, been recorded by those voyagers who, in recent years, have touched the coast of this Island and have landed there for a few hours (by Norden-skiöld, for example, and the enterprising staff of the “Wilhelm Barents”), to show what a wide and interesting field remains here to be worked.

For the Samoyeds, though nominally under the direction of the Greek Church, are still by choice and practice idol worshippers, or at any rate votaries of a religious superstition in which fetishes, and the propitiation of spiritual powers by means of sacrificial acts, play a central part. According to the reports of those who have visited these coasts, certain high points are sacred and sacrificial eminences—mounds upon which are grouped rough wooden images smeared with blood, propitiatory offerings in the shape of skulls of the Walrus and Polar Bear, and so on. In connection also with the disposal of their dead, the Samoyeds have retained those customs which we ourselves associate with the practice of our own heathen forefathers, *e.g.*, supplying the dead man with food for his long journey; leaving cooking utensils and his sleigh by his side; with other customs of the same character.

It is not a little remarkable that anthropological collections in this country are singularly deficient in objects of any kind belonging to these interesting people. Whether the British Museum is better off in this respect than it would appear to be I do not know, but when I examined the cases carefully not long ago I failed to find any there. And I am assured by Dr. Tylor that the splendid (Pitt Rivers) collection at Oxford, contains no Samoyed relics whatever. Yet it is only within recent years that the tribes have renounced the use of the bow; for in the old pictures they are represented as archers. Here, then, is one form of relic at any rate, which, if it could be obtained, would be of great interest. For in no part of the morphology of customs is there a more interesting and curious evolution than in the development of this most ancient weapon.

Now we must remember that though Novaya Zembyla and Vaigatz Island only became known to the inhabitants of Western Europe by means of Stephen Burrough's voyage, in 1556, nevertheless, he found a trade existing even at that time between the natives (Samoyeds, Ostiaks, Chukches) and small Russian Traders. And the settled condition of this trade points to the certainty that it must have had its origin many many years before. And although this trade has itself been dead now for more than a hundred years, there are traditions which point to the strong probability of the Samoyeds having taken their reindeer to pasture on Vaigatz, and having regarded

this island as the central home of their religion a thousand years, perhaps, ago. Now, the researches of Castrén and others notwithstanding, the fact remains that even at this moment neither the philologist nor the anthropologist is agreed as to the exact position occupied by the Samoyed.

They appear to be the lowest in the scale of all the Polar races, as the Reindeer Lapps are the highest. They appear to have suffered also great deterioration from the influence of the neighbouring Caucasian and Mongol races, and to be rapidly dying out. Philologists describe their language (which belongs to the Ural-Altaic stem) as having no affinity with that of the Finns, or even of the Ostiaks, their nearest neighbours. This question of race the evidences of craniology will no doubt help to determine, but it would seem that so far we are in want of material upon which to work.

Further, an immense field for enquiry lies open in the direction of their prehistoric relationships. Are there caves in Vaigatz? Can we collect evidence that will go to show that, like the Eskimo, these people are the descendants of the old cave races, driven northwards, as the other Eskimos, by their neolithic successors?

There is very much more that might be said on this most interesting question, but I have said enough, I hope, to show that a careful exploration of the interior of Vaigatz Island would not only enrich our national collections, but would go far to settle the interesting question of the exact position of this the lowest and most primitive of all Polar races, as at present known.

Zoologically such an enquiry may fairly be expected to issue in important results. It is not surely too much to hope that a careful examination of geological strata of caves and alluvial deposits might throw much light upon the vertebrate fauna which existed in these high latitudes as contemporaries of the mammoth, whose remains form so important a part of the Siberian tundras.

The seas themselves may be expected to contribute, under the dredge, additions to our list of invertebrate life, beyond anything one can conceive. Such rapid investigations as the scientific staff of the *Vega* were able to make during their journey east were singularly fruitful. The seas, immediately to the east of Novaya Zembla and Vaigatz, are not deep (from 10 to 60 fathoms) and yet of such an exceeding salinity that below there is always a layer of unfrozen water. This is haunted by immense numbers of decapods, asterns, crustacea, and other marine invertebrates, of which the dredge of the *Vega* added several new species to those already known.

The insect life of these islands appears to be—as indeed one would expect—of an exceedingly limited character. Nevertheless, careful investigation may even here be well rewarded, for during the short visit of Nordenskiöld to Beli Ostrov or White Island, he was able to collect more than one beetle entirely new to science.

The present condition of the “right” whale, so numerous in those seas till almost exterminated by persecution; the distribution and breeding conditions of the walrus; the distribution of and obscure points in the life of the lemming; the breeding places of certain birds (now entirely unknown to us); these are a few only of the questions which we may hope to have determined by an intelligent explorer in these parts.

There is, for example, a small bird, one of the large family of the waders, which in autumn and winter is exceedingly numerous on our coasts. It is known as *Tringa subarquata*, the curlew-sandpiper. No European collector has an egg of this bird in his collection, for its breeding place has never been discovered. The Petchora Valley, the Yenesei, the Lena delta—these and other apparently favourable districts have been searched in vain. And yet in some corner of the northern world they must nest in immense numbers. It seems not improbable that Vaigatz may be found to be one of their breeding places. But even if Vaigatz should fail, there is another island

which may be taken on the way to Vaigatz, which I am convinced will be found to be the home of the bird. This is the island of Kolgoniev—low-lying, marshy, full of streams, and resorted to in summer by immense quantities of eider ducks, Bewick's swans, and geese.

It seems probable that the impetus given to travel in these regions by the projected Trans-Siberian railway, and the facilities for voyaging to the Kara Sea likely to be afforded by traffic in connection with conveyance of railway plant to the Yennesei will, in the near future, result in these islands being over run and losing their present primitive character.

For commercially Vaigatz is most favourably situated, as being the *key of the Kara Sea*. Any such company as succeeded in acquiring a concession from the Russian Government, would, with head-quarters on Vaigatz, be in a position to command the trade of those seas. The trade in hides, tallow, furs, which now filters through Russia, could be focussed at this point where goods could be held in store pending favourable conditions for bringing them to England. Whether the gold of the Urals, which once attracted so much enterprise will ever again be worked on any large scale must be left to the future to determine. Perhaps it may.

But, putting all commercial considerations out of view, I have said enough, I believe, to show that from a purely scientific point of view, there lies in Vaigatz a field of very great interest waiting the enquiry of the first properly equipped person who shall journey thither. It is not possibly—in these days when High Polar and African exploration are so much before us—a very startling programme, but I am inclined, for all that, to believe that more actual satisfactory results are likely to be gained from an ordinarily intelligent investigation of this one island than from a big national expedition to find the Pole itself. This is why I have turned my thoughts to Vaigatz.

I hope to leave this country in June next, and, after visiting the island of Kolgoniev, to push on to Vaigatz as soon as the conditions of the ice will admit. If funds would have allowed of it, I should much have preferred to have gone in a steam yacht, which would have rendered me independent to a very great extent of ice and wind and weather. But, as it is, I am compelled to trust to the sailing powers of one of the walrus boats which leave the north of Scandinavia in the early summer for the hunting grounds of the Kara Sea. It is for the purposes of enquiry and arrangement with a view to this that I am now on my way to the White Sea.

There is one more point which I cannot help mentioning. I am not without a secret hope that I may be able to enrich the collection of our Zoological Society by the acquisition of a young walrus. I believe I am correct in saying that only one has ever reached these shores alive. This was, if I am not mistaken, during the reign of Henry VIII. It only survived a short time. The natural food of this creature consists very largely of molluscs, *e.g.*, mussels (*mya truncata*) and this has been the great obstacle to bringing home the animal alive. But now, with the improved means at our disposal, I think it would not be impossible to store a supply of mussels large enough to keep a small walrus alive till it reached London, if old enough to feed itself.

THE INFLUENCE OF RAINFALL ON COMMERCIAL DEVELOPMENT: A STUDY OF THE ARID REGION.

By MR. JACQUES W. REDWAY, Editor of "Goldthwaite's Geographical Magazine."

[Read to the Members in the Library, Wednesday, October 18th, 1893.]

FORTY years ago there was one feature on maps of the United States that invariably demanded the respectful attention of any one who might unfortunately seek information concerning the topography and drainage of our possessions west of the Mississippi River. This impressive feature was a vast area of territory, roughly elliptical in shape and severely definite in outline, bearing on its face the portentous name, "Great American Desert."

In time, as settlement and exploration pushed westward, the boundaries of this area, little by little, were contracted, until they finally disappeared, and the name itself was transferred to a small and indefinite territory lying west and south of Great Salt Lake—the dry bed of a former inland sea, which, at a period not greatly remote, poured its surplus waters into a tributary of the Columbia River. Thereupon it became the custom to smile at the ignorance of our cartographers whenever any allusion to our desert possessions was made, and we triumphantly pointed to the statistics of population and produce in refutation of such an absurdity. At the same time we gave with a free hand from our treasury of public lands to whosoever asked. Among the recipients of public bounty were, it is needless to say, railway corporations, cattle-syndicates, and land-speculating trusts. The rest was left to the *bona-fide* settler, with an implied understanding that he must not complain if a railway company or a land trust swooped down upon his home and holdings, after he had improved the land and made it productive. It is almost superfluous to add that the cultivable prairies and the river bottom lands were acquired mainly by the speculators and corporations. The remainder was the property of the homesteader and the pre-emptor, and it is concerning this remainder that I wish to present a few facts.

It may be considered a piece of impertinence to intimate that neither the average newspaper writer nor the average reader fully comprehends the somewhat indefinite term "desert." I am inclined to believe, however, that he does not. Almost always we associate the word with a vast expanse of sand. Even the critical German geographer habitually speaks of it as a sand-waste (*sand-wüste*), and the term "sanding" is technically applied to the stipple-marks that on our maps conventionally represent desert areas. True sand, however, a form of silica, is the oxide of the non-metal silicon, and is usually a product of sea shores. Excepting the external varnish of silica, which protects and strengthens the stalks of certain endogens, this element plays no part in biological processes or in plant economy in general. Mixed with clayey soils, it mechanically renders them more porous, and by

increasing their capillarity, gives to them a greater power to hold as well as to absorb moisture. This element is not an essential, however, and a soil of pure sand is absolutely sterile.

Now if there is anything scarce in desert regions it is true sand; water is abundant in comparison. That there are vast extents of finely-divided pulverulent soil that shifts and drifts with the winds, is true. Except in rare instances, however, it is not sand. The quarternary, detrital deposit covering the Colorado Desert of Southern California is an example in question. This substance passes casually for sand, and, as a matter of detail, it makes a most excellent mortar, both for masonry and interior finish. It contains a small percentage of silica, but a close examination shows it to be composed of finely-divided felspathic rock—the disintegrations of granite, syenite, and actinolite—extraordinarily rich in all the elements, water excepted, for the fullest development of plant life.

To a greater or less extent the same is practically the case of most desert areas. So far as physiographic condition is concerned, the soil of a desert may be of almost any character, detrital or sedentary, shingly or pulverulent, compact or drifting, basic, acid, or saline, in chemical structure. Moreover, topographically and physiographically, the surface may be level, undulating, or mountainous; the climate may be hot or cold, equable or extreme. There is one essential mineral element wanting, and until this is supplied, a desert will be a desert, no matter how rich its soil. This essential is water, and its presence or absence makes practically the only distinction between fertile and barren lands. That there are localities, the soil of which is destitute of nutritive minerals, or which contains substances fatal to the existence of plant-life, is true; but such areas are inconsiderable in size, and they are impartially distributed among both rainless and rainy regions.

Deserts, therefore, may be defined as regions deficient in the amount of moisture necessary to support plant-life. Practically, one may make a more conventional distinction, and regard them as regions so dry that ordinary food-plants will not mature there. The belief that the soil of deserts is innutritious, has become almost traditional. Yet, as a rule, the contrary is true; it is rich because few, if any, of its nutritious principles have been exhausted. The truth of this statement is emphasized when one recalls the few artificial oases in the Colorado and Mojave deserts. The former is a broad expanse of white, felspathic detritus, mercilessly pelted by sand-blasts and writhing under a sun so scorching that even the few species of cactus wither and turn yellow; yet, at Los Palmas, a small tract watered by an almost forgotten spring yields such a profusion of flowers and tropical fruit that one might almost imagine it the Vale of Paradise, planted beyond the reach of profane defilement, and guarded by fierce simoons.

In view, therefore, of the fact that a desert owes its characteristic conditions to a lack of water, and bearing in mind also that the rainfall of an area as large as the United States may vary from *nil* to one hundred inches or more, one might expect to find almost every possible degree of productivity; and this is the case. Plant-life is far more sensitive to the vagaries of rainfall than one would naturally suspect. A difference of one or two inches in amount, or the slightest disturbance in the distribution of precipitation, may decide whether a given species will thrive or perish in a certain region. Indeed, so extremely sensitive are some well-known species of food-plants, that, the distribution of precipitation unchanged, a deficiency of one inch in amount over the region cultivated would cause a measurable disturbance in the industries of that region. That is, if ten inches in amount, or a monthly distribution, is essential to perpetuate a species of grass, it will thrive and extend its geographical limits when the annual rainfall is eleven inches; it will perish and disappear if the

precipitation is reduced to nine inches, or if there be yearly a period of drought exceeding one month.

In the United States we find not only an annual precipitation, varying from practically nothing to one hundred inches, but in the matter of distribution, also, there is every variety, from a cloud-burst once in two or three years, to an almost steady downpour during ten out of every twelve months, and occasional showers during the remaining two.

East of the Mississippi River there is practically no area in which, so far as moisture is concerned, grass and the cereals cannot be profitably and profusely grown. In no part is the rainfall less than thirty inches per year, and the average is nearer forty inches. If there be any cultivable part of this region, therefore, in which grass and grain-growing is unprofitable, it is because of the high value of the land, or else its inaccessibility to a market. A high value of land is, of course, an effectual bar to grain-growing; but inasmuch as land at \$1,000 per acre will commonly yield a much greater income from other products than land at \$30 per acre sown with wheat or corn, there is little or no actual loss of productivity. The Mississippi Valley is one of the most fertile regions in the world, and if we consider its size, it is capable of producing a more valuable harvest than any other river valley on the face of the earth. And if its grain-producing power is not enough, there are the almost inexhaustible stores of coal and iron. So far as natural resources are concerned, there is no reason why this region should not become the greatest empire under the sun, for there is no other of equal size capable of supporting so large a population.

Beyond the Missouri the rainfall lessens considerably. The northern part of the Pacific slope excepted, no part of this area receives more than thirty inches of rain, and in the greater part—aggregating nearly one-fourth the area of the whole country—the annual precipitation is less than fifteen inches. For convenience we will divide this extent of area into three regions: the “Plains,” the Colorado Plateau, and the Great Basin. There must also be included the inaccessible, and therefore uncultivable, mountain slopes, in some instances snow-covered, in others denuded of soil.

By far the most fruitful area of the three is the region commonly known as the “Plains.” From the Missouri River westward it rises imperceptibly to a plateau, varying from 3,000 to 6,000 feet in elevation. The eastern part receives a generous supply of rain, and as far west as the 96th meridian it is all that can be desired in point of fertility. West of this meridian farming is carried on mainly in the river-bottom lands. Grain-farming on the sedentary or “bluff” soil is too uncertain in its results, and this part is given up to stock-raising. West of the 99th meridian there is but little land of any kind that may be called productive. Even along the small streams about the only crops that are produced are confined to small patches of barley or of corn. Probably ninety-five per cent of this area is used directly or indirectly for stock-raising, and in the last twenty years it has been so thoroughly overstocked that at present, instead of the traditional two head of cattle that an acre of land is supposed to support, an average of at least four or five acres is necessary to each head. Not an acre has ever been seeded or in any way cultivated; on the contrary, its surface has been so thoroughly tamped and packed by the hoofs of millions of cattle, that the productive power of the soil is reduced to its minimum value. It is cheaper to rob the United States of the nutritive elements of the soil than to buy the land. In the opinion of the stockmen, it is more economical to starve a herd once every seven or eight years, than to feed a smaller herd a part of every year. In other words, the average grazer is content to have the one golden egg, and bequeath to posterity the carcass of the goose. The fact that the food-producing power of the plains is growing less with each succeeding year, has not been

emphasized. Not only is the percentage of growing grass reduced each succeeding year, because of the lessened amount of seed falling upon it, but the everlasting impact of hoofs has so packed the soil that its power to receive and hold the small amount of water is also greatly lessened. The water, therefore, instead of penetrating the ground, is drained off at the surface; so the soil is not only becoming poorer, but drier. Its grass-producing power can be increased only by ploughing and seeding, and, under the present laws, this step is out of the question. Grass once weakened in vitality, if not destroyed by the cattle, becomes the prey of noxious weeds, and the latter ultimately take its place. What is every one's business in this case is so manifestly no one's business that such a thing is not to be considered.

The Colorado Plateau is bounded mainly by the Uinta and Wasatch Mountains. The upper part of the river-basin is in a fertile and well-watered region. It comprises within its area a large amount of cultivable land and some of the best stock ranges in the country. The greater part of the drainage basin, however, consists of a succession of sandstone mesas—the bottoms of old lake-basins, that in past geological times were upheaved and synchronously desiccated. Through this area—somewhat more than 250,000 square miles in extent—the river and its tributaries flow in cañons, varying from a few hundred to more than six thousand feet deep. The streams, therefore, are practically underground streams, and so far as supplying water for purposes of irrigation, they are of little or no actual use.

The plateaus, though characterised by a monotony of structural detail, are vastly different in climate and physiographic aspect. Shivwits Plateau, for instance, the lowest in altitude, is generally barren and desolate. The edges are frayed and notched with gulches and miniature cañons, which carry water only when some straggling rain-cloud discharges its contents on the mesa in the form of a cloud-burst. Springs are found here and there, however, and around the vicinity of each are clustered the wickiups of the squalid Shivwits Indians, who manage to exist on the few acres of corn they cultivate. Uinkaret Plateau, one of higher altitude, is more habitable. It receives a fairly generous rainfall, and, in consequence, there is a considerable area of good grazing land, with here and there a stream flood-plain of a few square miles in extent. Kaibab Plateau is the highest of the mesas. Owing to its altitude it is covered with deep snows during the winter months, and as it possesses a deep and nutritious soil, there is an abundance of grass and timber. Owing to the topography, it is not generally well suited for cultivation, but no better region can be found for summer grazing. These three mesas are fair types of the surface of the Colorado plateaus. The lowest, "sandy" and alkaline in character, are worthless for the cultivation of crops, unless the latter be of lizards and rattlesnakes. The midlands are moderately well watered, but the cultivable lands are confined to the river valleys. The highlands are cold but productive. The lower course of the Colorado River—and of several of its tributaries as well—lies practically in a desert region that possesses no drainage to the ocean. The rainfall is scant, rarely exceeding an inch or two a year, and in many places consisting of nothing more than an occasional cloud-burst.

The Great Basin proper is a triangular-shaped area, about 225,000 square miles in extent. The northern part borders on the drainage area of the Columbia and Klamath rivers. It receives sufficient rain to insure a fair yield of grain on such land as is adapted to grain-growing; but here, as in other parts of the western highlands, grain-growing must be confined to the river flood-plains. The central part of the basin is traversed by parallel ridges, the upturned edges of immense, faulted blocks, having gentle eastern and abrupt western slopes. The base of the plateau, or more correctly speaking, the floor of the basin on which these ridges rest, is from 3,000 to 5,000 feet above sea-level in its greater extent. The ridges themselves have an altitude varying

from 7,000 to 11,000 feet, and are therefore capable of wringing more or less moisture from the few clouds that pass the crests of the Sierra Nevada Mountains.

The northern part of the Great Basin has a rainfall sufficient, by the aid of irrigation, to make productive a few thousand square miles of land. The central part contains but little grazing and less cultivable land. The higher slopes of the ridges are grass-covered, and at their bases there are a few ephemeral streams whose flood-plains may possibly afford each a small acreage of barley-fields. The only streams of any size are Humboldt, with its tributary Reese, and Carson River. In their upper courses these streams are mountain torrents. In their lower parts, however, they carry but little water, and in very hot weather disappear altogether. A few square miles, suitable for garden or barley ranches, is the extent of the cultivable land in their basins.

The lowest and southern part of the Great Basin is irreclaimable and practically uninhabitable. Excepting the crests of the granitic ridges, there are but few parts of this region more than 1,000 or 1,500 feet above sea-level, while more than 2,000 square miles are below it. Along the western edge there are here and there a few acres of land that may be made productive by irrigation, but even these spots, rare as they are, are seldom utilised. Death Valley and the Sink of the San Felipe—the latter now better known as Salton Lake—are situated in this part of the Great Basin. The whole region is typically a desert. Cacti and yuccas are about the only forms of vegetable life, and in much of the area these are dead, and their spiked, thorny stalks and trunks are bleached to whiteness under a scorching sun whose direct rays register 130° to 145° on the thermometer. So intense is the heat in this region that evaporation from a body of water of considerable depth exceeds 100 inches per year. In shallow pools it is nearer two-thirds of an inch a day. The Sink of San Felipe River is scarcely 600 square miles in area, yet the whole flood of the Colorado River is insufficient to fill it to the level of the sea.

The foregoing paragraphs give a brief description of the arid lands of the United States. In round numbers this region has an area of 1,340,000 square miles, or upwards of 900,000,000 acres. This does not include all the land where crops must be irrigated. There is a belt one hundred miles in width or more lying on both sides of the 98th meridian, in which crops may mature finely one season, and, for want of water, perish the next. But leaving this area out, we must open our eyes to the fact that one-third of the territory of the United States consists of land that cannot yield food-crops without artificial aid. Of this vast area Professor Powell estimates about 500,000,000 acres would be productive were there sufficient rainfall. The remainder consists of rock and shingly surfaces, and of slopes so rugged that their cultivation would be out of the question.

Now, experience has shown that an acre-foot of water—that is, the equivalent of a rainfall of twelve inches—if applied to the ground judiciously, is sufficient to insure a fair grain crop. We must bear in mind, however, that this estimate is an average rather than an actual value. In stiff, impervious soils, especially if there be considerable slope, twice that quantity of water might not suffice, while in the loamy soil of San Fernando Valley, in California, six inches of rain, falling opportunely, will insure a fair yield of grain. Taking all the factors into consideration, however, the surveys of Professor Powell demonstrate that about 100,000,000 acres of the now unproductive lands of the United States may be reclaimed—an area about four times that of Pennsylvania, or nearly equal to that of Ohio, Indiana, Illinois and Iowa combined.

Now, the reclamation of these lands, which at present are practically deserts, must depend on irrigation; but the manner in which the water must be obtained may be one or more of three ways—storage of surplus waters, artesian wells, and sub-

merged dams and sand reservoirs. Of these, by far the most important is the storage of storm waters.

In many parts of the said region there are large areas in which the rain is not sufficient to form permanent streams, but where the only flowing waters are those of storm streams. These may be turbulent torrents during a few months of the year, but they are dry washes during the greater part. Now, as such streams have no commercial value beyond the amount of water they contain, their contents may be impounded in reservoirs during flood seasons and measured out at times of drought. In the "plains" these stored waters will be valuable, not only on lands where the crops are uncertain, but they will be useful also to reclaim certain lands that are now unproductive. The impounding and storage of the contents of temporary or storm-water streams presents no difficulties in the way either of engineering or legal problems. The catchment basins are small in area, and they naturally localise themselves as to distribution.

In the case of larger streams, however, especially navigable waters, the problem becomes so complicated that nothing short of national legislation will be able to settle the conflict of State and private claims. For instance, a large part of the arid belt of Kansas will always be dependent on the waters of the Arkansas river for irrigation, but the only places where storage reservoirs can be constructed are high in the mountains in Colorado. That is, the Kansas farmer is as much interested in the proposed reservoirs at Twin Lakes as the Colorado farmer. Let us suppose that these reservoirs are constructed and the gates are closed for storage. This at once lowers the level of the stream, and cuts off the supply of water taken by a multitude of small ditches, whose head-gates are scattered along the river in the eastern part of Colorado. Now, inasmuch as the latter are prior rights, the courts of Colorado would sustain them, even though both parties to the suit were resident in Colorado—most certainly would they sustain them against the claims of the citizens of another State. Although the case mentioned is hypothetical, one such has already arisen. Some years ago the State of Nevada appropriated a large sum of money for the construction of storage reservoirs on Truckee River, the same being designed for the reclamation of land capable of a high degree of cultivation. After the surveys had been made it was found not only that the reservoirs must be located in California, but that the authorities of that State were ready to prohibit any scheme that would involve a change of water-level in California territory. The plans were therefore abandoned. There is another serious obstacle in the way of impoundment of storm waters that may also be felt at a future time. Suppose that the storage of waters becomes so general that the navigation of any river, now classed as a navigable stream, is obstructed. It is hardly necessary to discuss what the final result would be. Or, were the storage of waters to affect the free navigation of a river like the lower Colorado, whose mouth, constructively, is in a foreign country, is there any doubt about the outcome of the question? But the Colorado is not the only river presenting an international question; the Rio Grande, the Columbia, and half a score of smaller streams possess each a wider field for conflict. In fact, there is not a river of magnitude in the arid region that may not bring about either interstate or international complications.

There are, also, a number of difficult problems that are purely local to each of certain drainage areas. I take for illustration the drainage territory of the Rio Grande below White Rock Cañon. From the mouth of the cañon there are rich, reclaimable lands for a distance of nearly 200 miles below, unfortunately more than can be irrigated. Now, in the northern part of this area the river will afford irrigation for two acres to every one in the southern part. But at the present time the greater

part of the cultivated land is in the southern end of the valley, and either their rights should be maintained or else equity should be the basis of their extinguishment. These conditions have already led to long-continued litigation, and in several instances shotgun injunctions have demonstrated that the people are mightier than the law.

Such complications cannot be wholly prevented, but their occurrence can be largely obviated. Their number will be reduced to its minimum only when the catchment basin of each stream, no matter whether in one State or a dozen, is under the control of the landowners of that particular district. The water and the land must go together, and no water-owning corporations or companies should be permitted to exist under conditions by which the landowner may be subjected to a corporation's clinch. Irrigable lands are dependent upon catchment areas where forests and grass are most abundant, and storage reservoirs must, therefore, be constructed, not on the irrigable lands, but high in the mountains; and, to get the full value of the waters, the lands themselves must be selected as near as possible to the reservoirs. Pasture and timber lands should be permanently reserved, and all reservoir sites, canal sites, and headwater sites should be placed under the control of the general government.

And here let us consider the question of artesian wells. No more water can be obtained from an artesian basin than is supplied to it; it is equally true that the number of wells in a given artesian reservoir is limited. A well discharging a cubic foot of water per second may afford sufficient water to irrigate 200 acres; in the fruit ranches of Southern California it will supply the amount required by about seventy-five. Now if there were an artesian district that would furnish, from flowing wells, a second foot of water for every 200 acres, the problem of irrigating the arid lands would be an easy one. There would be no need of the 150 reservoir sites and irrigation districts the United States Irrigation Survey has located. It would not be necessary to impound a gallon of water, nor construct a yard of canal. But, unfortunately, not all artesian wells are flowing wells, nor do all the flowing wells yield an average of a second foot of water; on the contrary, they yield but a small fraction of it. Furthermore, though the first wells driven in a district may be spouters, the driving of additional wells quickly reduces the pressure; the flow from the first well diminishes little by little; the water-head is soon lost, and water must thereafter be obtained by pumping. So, instead of the seventy-five acres which the theoretical second-foot well is supposed to irrigate, the actual value is nearer five. In Southern California, in several instances, efforts have been made to force the yield of wells by means of powerful pumping machinery; but no matter how powerful the pump, water cannot be drawn into the induction pipe faster than the sand and gravel yield it. Moreover, if all the artesian wells used for irrigation throughout the whole world were assembled in a desert region the size of the State of Delaware, they would not supply it with the amount of water required to irrigate it. This statement seems pretty strong, but the statistics gathered by the Irrigation Survey bear it out. In Algeria 4,000 acres have been reclaimed by irrigation. In Southern California State Engineer Hall affirms that less than 3,000 acres have been made productive by irrigation. This, moreover, exceeds the acreage of all the other States and territories combined. And the moral is plain: artesian wells will afford only an infinitesimal part of the water required for irrigation.

There remain only the sand reservoirs and submerged dams to consider. The former present no problems essentially different from the catchment reservoir of an artesian district. The chief feature is the fact that a cubic foot of sand, saturated with the water it will hold by capillary attraction, becomes no inconsiderable reservoir when the number of cubic feet is multiplied. Unfortunately, the number of sand valleys and basins is small, and their aggregate area inconsiderable. The submerged

dam has even a more limited application, and so far as been employed mainly in Southern California. Here there are many hondas, or narrow cañons, opening like immense crevasses into the mountain-ridges that rise abruptly from a recently-formed coast plain. The mouth of each is filled to a depth of many feet with coarse talus—the products of stream-corrosion. A stream, great or small, according to the season, flows on the surface of the talus. Beyond the mouth of the cañon it may flow onward to the sea, or it may be entirely lost in the sandy soil of the coast plain. Now, although the amount of water flowing in the stream-bed proper is great, that which sinks into the ground and finds its way along the sloping bedrock is still greater. If now a concrete dam be built across the mouth of the cañon, from bedrock to a few feet of the surface of the talus, all this seepage or underground water can be impounded and utilised. Thus the submerged dams do not differ in application from the storage reservoirs. In Southern California there may be an obstacle in the way that will either prevent their general use or else bring about expensive and protracted litigation. The seepage water, thus impounded, is the water that supplies artesian and all other wells; and inasmuch as nearly all the water that flows out into the coast-plain through these cañons will be cut off by the submerged dam, complicated litigation must result.

In the foregoing pages only the salient facts concerning the reclaimable arid lands have been given. These, however, are sufficient to demonstrate that the expense of reclamation is too great, and attended with too many legal complications to be undertaken by any other than Government authority. Even after water has been supplied to each reclaimable acre, the expense of application will materially enhance the cost of the crop. An acre of wheat, irrigated by artificial means, cannot well compete with one watered by rains. Not only are the arid lands deficient in natural waterways, by which crops are removed at the minimum of expense, but because of the lessened amount of product, railway tariffs must of necessity be greater. Furthermore, the cultivable areas being distant from one another, and therefore from a market, the matter of distance will materially increase the cost of transportation. Owing to the abnormal increase of the population of the world, the value of food-producing lands is constantly increasing. When, therefore, the value of the grain-producing area of the United States has increased to an extent that the taxes absorb the greater part of the profit, food-crops will naturally seek the reclaimable lands of the arid region.

Because the area that is naturally irreclaimable is so great, it is evident that the western highlands of the United States will always be sparsely populated, and, compared with the Mississippi Valley, will support only a small fraction of the number per square mile that the latter will maintain. Its vast mineral wealth, however, will go a long way to make up for its food-producing deficiencies; and the development of its agricultural features will follow rather than precede that of its mineral wealth. The climatic conditions, humidity excepted, are generally favourable. Everything that can be cultivated between the latitude of Northern Norway and Southern Egypt can be grown in this region. Cotton, maize, wheat, barley, oranges, lemons, grapes, bananas, and pineapples are among the facts; the possibilities are far greater.

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MIDDLE EGYPT FROM PTOLEMAIC MAPS AND MODERN SURVEYS.

Contributed by MR. COPE WHITEHOUSE.

[Read to the Society in the Library, Wednesday, October 18th, 1893.]

MIDDLE Egypt is employed as a distinctive term for the region between Assiout and Cairo. It passes beyond the Valley of the Nile on the west, so as to include the oases of Ninellah, Khoreif, and Raiyān, with the desert-girt depression of the Fayoum. A comparison of the maps prior to 1882 with those recently published shows the changes that have been made as the result of my researches.

In 1882 maps were published in large numbers in every part of the world, as the outcome of the political events which then took place. The War-office maps issued by England and France, and those of private geographical establishments, prove how little was known of this region. The article, "Egypt," in the "Encyclopædia Britannica," and the guide-books of Murray, Baedeker, and Joanne, may rightly be considered as furnishing a fair statement of what was known.

In 1893, the following books and maps may be cited as showing the extent to which these changes have been accepted and are now considered as substantial additions to geographical knowledge :—

"Bemerkungen zur Karte meiner Reise nach der Kleinen Oase." P. Ascherson, *Zeitschrift der Geo. für Erdkunde.* Berlin, 1885.

"Reise in das Depressionsgebiet in Umkreise des Fajum." G. Schweinfurth, *Zeit. d. Geo. S.* Berlin, 1886.

"Notes on the Wady Rayan." Colonel Western, R.E., Mr. C. A. Lieurnur, Sir C. C. Scott-Moncrieff. Cairo, 1888.

"Egyptian Irrigation." W. Willcocks. London, 1889.

"Le Nil, le Soudan, l'Egypte." A. Chélu. Paris, 1891.

"L'Oasis de Moéleh et la rive ouest du lac El-Qeroun." Prof. Mayer-Eymar. Geneva, 1892.

"Le Irrigazioni nell' Egitto, con tre carte annessa." Prof. Benetti, Ministero di Agricoltura. Roma, 1892.

"The Fayoum and Lake Moeris." Major Brown, R.E. London, 1892.

The Fayoum (Map). Minister of Public Works. Cairo, 1893.

Over one hundred papers by me have been read and printed in the proceedings of seventeen scientific societies, and elsewhere; and scores of maps drawn, as the result of nine expeditions into the desert, and of those researches, whose practical value is described in the Reports of the Egyptian Ministry of Public Works (1887-93), and confirmed by the Foreign Office, Egypt, No. 3, 1891, 1892, and 1893.

"If I have been able to reveal "physical conditions which had hitherto remained entirely unknown to geographers" (G. Schweinfurth, *Kh. Geog. Soc.*, Ap. 30, 1883), it is directly due to the importance attached by me to Ptolemaic maps. In 1837 Lord Salisbury furnished me with a copy of a despatch from Lord Cromer (Sir F. Baring), in which he said: "Mr. Cope Whitehouse's scholastic researches led him to believe that a depression existed to the south of the Fayoum. Levels were taken, and it was

discovered that the depression, termed the Raiyān Basin, did actually exist. It was very much to Mr. Cope Whitehouse's credit that he should have made the discovery. There is hope that it may be utilised to the benefit of Egypt." Undoubtedly "geography, history, mythology, and language—facts, events, allegorical dogmas, and woods were all within the sphere of my preliminary studies" (*"Revue Archéologique,"* p. 340, 1882); but the outline of the Raiyān depression, and the shape and depth of the Nuellah oasis on recent maps, is solely due to the belief confidently entertained by me that the atlas which accompanies the text of Cl. Ptolemy is a valuable source of geographical information, and to a certain extent independent of the lists of positions given in the manuscripts.

So far as the theory of a submerged Fayoum in the fifth century is concerned the controversy is at an end. In 1882 I stood alone against the scientific world, displaying a rare unanimity, based upon the observations and reasoning of a large number of experts of the highest rank, from Jomard to Linant de Bellefonds, Brugsch, Lepsius, Schweinfurth, and Maspero. In 1892, Major Brown published his work which, as a lucid statement of his personal observations, with ample illustration of the evidence marshalled by him, by diagrams, maps, and photographs, is a valuable summary, so far as it extends, of the geography of this region. It had never been supposed that a Ptolemaic map could be of cartographical value, much less that it could lead to a discovery of importance to the welfare of Egypt and the world. It does not follow, of course, because a discovery has been made that the method was sound. This, nevertheless, is the issue. In the monastery of Mount Athos there is a manuscript with an atlas, believed to be of the twelfth or thirteenth century. The libraries of European capitals contain other manuscripts with maps which are not exact copies. The printed editions are numerous, and they too show that they were not all of them drawn from a common mediæval original. They differ, however, only in the neglect of certain details, and are not contradictory. They may thus be all copies, more or less incomplete, of some ancient maps long since destroyed. Each modification is susceptible of explanation. It is no part of my present task to show that these plottings of the earth's surface were the work of the Alexandrian astronomer and geographer, of whom nothing else is known but his epoch and home. It is neither asserted nor denied that the atlas was copied from maps which were ever in the hands of Cl. Ptolemy, or drawn by his predecessors or contemporaries. It is, however, contended that they are not the work of mediæval draughtsmen. The proof on which I rely is the map of Middle Egypt, which could not have been drawn from the lists of positions given by latitude and longitude, nor plotted upon a map of any period later than the fifth century, not even aided by the geographical information attainable from ancient writers, such as Herodotus, Strabo, Diodorus, Pliny, Aelius, Aristides, and Stephen of Byzantium.

"All authors agree," says Dr. Schlichter, in his masterly examination of the topography of Eastern Equatorial Africa, "that Ptolemy must have had the help of a globe or map when he worked out the text of his geography, but it would be wrong to conclude that the maps at present are the original ones of Ptolemy, because, as Bunbury correctly says, the tables enable anyone to construct such maps for himself." This I deny, maintaining that, while a map might have been constructed, those who from before Jomard downwards have sought, like Lepsius, Réclus, and others, to draught a map of Ancient Egypt have signally failed to produce a trustworthy result. In justice to Sir E. H. Bunbury, it should be noted that, in 1886, he wrote: "It appears on the whole most probable that the maps appended to the manuscripts still extant have been transmitted by uninterrupted tradition from the time of Ptolemy." It is now sought to establish this opinion, thus tentatively stated, on an impregnable

basis. Those who listened to Sir F. de Winton, at the Manchester meeting of the British Association, will remember that the so-called Ptolemaic map exhibited by him was not a fac-simile, but one of those reconstructions, plotted in Germany, by a cartographer who projected the lists of positions on a map, which represented his conception of the limited bounds of the knowledge possessed by the scientific and commercial circles of Alexandria, in the second century A.D. If the arguments here presented are regarded as convincing, it may be fairly expected that the "*orbis veteribus notus*" which defaces the atlas in common use will disappear. It is a disgrace to modern science. It owes its intrusion solely to the disrepute into which the Ptolemaic Atlas fell after the time of d'Anville. University men of high rank, classical scholars of profound and accurate learning, are ignorant, as I have ascertained by personal experiment, that the latitude and longitude of London were known to the Roman world of letters. It is a surprise to many to find that in the Mount Athos text of Cl. Ptolemy we should have diagrams illustrating the difficulty of projecting a round surface on a flat page. It is not rare to meet with men engaged in instruction who believe that the world was always and everywhere supposed to be flat before that period which is nevertheless termed, "the revival of learning." The captain of the ship whose celebrated voyage terminated in the disaster of St. Paul's Bay could, undoubtedly, have shown his distinguished passenger a chart of the British Isles. At all events the ports are fixed by astronomical bearings in the Ptolemaic text, as well as on the maps.

Medieval maps are of two distinct classes. Either they are of the type of that magnificent cosmograph, the work of Fra Mauro, or they have the same simplicity of a classic style, and are expressed, to borrow a phrase from Dr. Nordenskjöld, in the cartographical grammar of Ptolemy. Two atlases may be found of the same fifteenth century in the same library. The delta of the one has twelve mouths, of the other two. Certainly Ptolemy gives in his lists of positions the number and names of these embanked channels, by which, in the Greco-Roman period, the flood waters of the Nile were conveyed to the Mediterranean, between plains covered with summer crops, where, through the devastation wrought by internecine warfare, the vast lagoon of Menzaleh was formed a hundred years before the Arab conquest. What monastic draughtsman would have taken the trouble to put them down with accuracy, or leave a narrow isthmus between the Trajanus Fluvius and the Red Sea, resisting all temptation to give it a natural outlet, because, after the battle of Actium, Cleopatra found it an obstacle to the speedy transfer of her fleet to Asian waters? Such an argument assumes a breadth of view and familiarity with classical authors for which there is no authority. The wall maps of the Doge's Palace alone are a sufficient reply. The so-called "Agnese," in the same building, is a manuscript atlas of 1554. A century after Fra Maweo, M. Baptista embodied, in one volume, a map of America from the latest discoveries. It includes the best map that we possess, in certain details, of Middle Egypt in the Roman period. On the same page there is a Red Sea, duly coloured with carmine to justify the name, and a Mount Sinai raised by religious fervour a hundred miles in height. It is not difficult to distinguish the vagaries and amplifications due to the artist's originality from the material inherited from the ancient world.

The changes that have taken place in the areas of land and water in the Fayoum furnish a convenient and crucial test. The Batavia of Caesar, Holland before and after the formation of the Zuyder Zee, and the map of the future, should this area be again reclaimed, show in the low land at the mouth of the Rhine what the delta of the Nile has undergone since the mythical days of Menes, when all Egypt was annually converted into a swamp as far south as El Lahun (Herodotus). In B.C. 1400 the Fayoum was cultivated. It is an opinion which, if formed originally by me, may now,

I think, be considered as at least highly probable, that the Fayoum was converted from a vast sheet of water into a fertile province at some period between the fifteenth and nineteenth centuries B.C. Then the undoubted value of this area as a flood-escape for the high Nile and for the speedy drainage of the adjacent provinces of Minyeh and Beni-Suef, together with political changes, led to the gradual reversion to its former state. It was this submerged Fayoum which would have appeared on a map of the fifth century B.C., as Lake Moeris, the "Sea of Seas." From the second century onwards the influx of the Nile, limited to less than the annual evaporation, enabled Greek kings and Roman governors to develop, to the highest point, that Arsinoite Nome, which was described by Strabo in terms of just enthusiasm. The tradition lingered, sustained by the remains of towns and canals. Four centuries ago an Arab writer exclaimed: "Oh that the rulers of the land would cast their eyes upon this province and seek to develop it; then would its revenues return to their ancient amount!"

The map of Ptolemy shows no lake in the Fayoum. Doubtless, as at present, there was always a marsh of some extent, and it has always seemed to me possible that with rice and other vegetation, absorbing and evaporating considerable volumes of water, the surface actually unproductive might, at least, be reduced to such insignificant dimensions, that the Birket-el-Qerūn would find no place on a map of even larger scale than that with which we are here dealing.

This map depicts a body of water to the south of the Fayoum. It has a most unusual shape, and one not now characterised by any important physical feature. On the other hand, the shore-line of the Lake Moeris of the Ptolemaic maps is exactly that of the Raiyān depression, if filled to the level of the Nile in the adjacent valley. If the contour were taken at a lower level, even though this were not more than 100ft., the shape would be entirely different. The contour a few feet above high Nile would, similarly, be of another and wholly distinct form. There are many valleys—in fact it is the rule—where, as in the case of the Lake of Geneva, the general shape would be unaltered by even a considerable variation. The valley would be marked if it were dry. The Raiyān depression, however, although somewhat larger than the Lake of Geneva, and sinking to a depth of 150ft. below the level of the sea, offered no salient feature to those travellers who traversed it, from Belzoni to Dr. Ascherson. It was because Herodotus had said that the major axis of Lake Moeris, in his time, lay north and south, that I went into the desert beyond Gharaq. It was because this Ptolemaic map showed that a body of water, filling this Raiyān hollow, would not rise above the *cal* which bounds the Fayoum on the south-west, that I persisted for five years in urging upon the Government the feasibility of creating a vast reservoir for the control of the Nile flood, and the supply of the low Nile in the three months during which the river now ceases to communicate with the Mediterranean, and the salt water backs up fifty miles into the heart of the delta.

It is quite true that there have been no such lacustrine remains found in the basin itself, as one has reason to expect, if for several centuries it was in communication with the Nile. The problem is only increased in difficulty if this is considered a fatal objection to the use of the basin in past ages. The latest map of Egypt in Mr. Milner's recent work, as well as that of the Italian Government, represents a Raiyān Lake. I concede that this area may have been tinted with colour by the cartographer of the second century, in anticipation of a day when the water should justify his prevision. The explanation seems to me, however, barely within the limits of a rational possibility. At all events the Reports of Her Majesty's Government are explicit. Lord Cromer said, in 1891, that my project "to divert a portion of the flood into a great natural depression, existing to the west of the Nile Valley, and

there to form a storage reservoir to be drawn upon as the water in the river decreases, has been examined and found feasible." In 1892, Major Brown writes: "There are four uses which the Raiyān depression might be made to serve, if a communication with the Nile Valley were established—

- "1. As a reservoir of control for the Nile floods.
- "2. As a reservoir of storage to supplement the low Nile.
- "3. As an area to be brought under cultivation.
- "4. As a receptacle for the drainage of the Nile Valley during the flood season."

In this cartographical enquiry we have nothing to do with the answer to the question shortly to be submitted to an International Commission of Engineers. "What is wanted," writes Lord Cromer, in 1893, "is that Egypt shall have the best possible reservoir, whether it be in the Wadi Raiyān or in the Nile Valley itself, formed by means of artificial dams." They may decide against the lake, and the valley may be relegated to the obscurity from which my efforts have drawn it. Although this does not appear to me probable, yet so far as the value of Ptolemaic maps is concerned, it is obvious that the same reasons which have induced the engineers and geographers of the present day to give prominence to this wild waste of utter desolation would have had equal weight in that flourishing period of Egyptian history in which the text of Cl. Ptolemy was written. It is therefore not only good evidence for the antiquity of this particular map, but it carries with it the conviction that the others in this atlas, which, singularly enough, commences with Ireland, deserve a careful study. The atlas of Cl. Ptolemy is a monument of ancient cartography.

Climatology of the Cotton Plant.—Dr. P. H. Mell contributes a report (*Bulletin* No. 8) on the climatology of the cotton-plant to the U.S. Weather Bureau. He deals with the three chief varieties, the *Gossypium bahama*, native to Egypt, the *Gossypium barbadense* from Persia, and the *Gossypium herbaceum*, a name applied to all cotton grown in the interior of the cotton belt. At the opening of the American civil war in 1861, the cotton region included South Carolina, Georgia, and Florida, Alabama, Mississippi, Louisiana, part of Tennessee, Arkansas, and Texas, between the Gulf of Mexico and 34° N. lat. Up to 1860, this belt was gradually extending east, west, and north. On the east it reached the coast of North Carolina, on the West as far as the Rio del Norte in Texas. The counties around Memphis were the most productive. A line running a little north of the 36th parallel marked the northern limit of the cotton belt, which was bounded on the south by the 29th parallel. But owing to increased demands after the war, attempts were made to force the cultivation of cotton to the north of this limit. All such attempts to extend the cotton-growing area much beyond Tennessee have failed, and at present the limits remain nearly what they were in 1860. The regions of high per centage are confined mostly to the central parts of Mississippi, Alabama, and Georgia, where the area under cotton averages above 65 acres per square mile. Regions of maximum growth of cotton form two belts, one lying along the Mississippi within the alluvial region, while the other lies in the black prairie district stretching from north eastern Mississippi south-eastward through the centre of Alabama. In Tennessee it is to be noticed that the counties which produce most cotton are the most southerly ones, and the production decreases almost uniformly towards the north. This is specially so in West Tennessee, and in explanation it is to be noted that the isotherms for spring and autumn extend north-west through the state parallel with a line running through Chattanooga and Trenton. The cretaceous formations, as in the "Black Belt" of Alabama, have been found most adapted to the growth of the cotton-plant. Dr. Mell proceeds to contrast the climate of the southern States with that of other cotton-growing countries, the West Indies, India, Mexico, Australia, Brazil, the Argentine, and Egypt, and concludes that only in the southern States are found such uniform distribution of rain, and such gradual changes of temperature as are essential to the perfect growth of cotton. In the cotton belt the mean temperature of the three summer months is remarkably uniform; in June, the mean ranged between 81° and 76°, in July between 83° and 78°·5, and in August between 81°·5 and 78°·5. The mean daily maxima and minima are never great extremes. . . . —*The Geographical Journal Monthly Record.*

AFRICA.

[Read at the African Congress, Chicago, August 22, 1893.]

AT a World's Convention it was a noble conception which set apart one section for the consideration of matters having relation to the African Continent, and it is a privilege to be allowed in a very small way to take a part therein. The oldest and the newest meet in this great land.

The "Dark Continent" Africa was, and it is hardly the "light" continent yet. However, the times of great discoveries are now ended; and the future must be more minute and topographical.

Europe, Asia, and America have inflicted untold woes on the people of this part of the world, and it is only right that they should combine in the effort to give of their best in religion, science, or government to those who remain, that they may enter equipped into the community of nations.

Looking on a map of this great promontory, the eye is struck with the remarkable features of the country. The length (5,000 miles from Ras-el-Kerun to Cape Agulhas). The great breadth in the North, decreasing to a tongue at the Cape of Good Hope. Like a great triangle ∇ , the base at the North and the apex to the South. The almost total absence of indentations of the coastline by the sea is a striking feature, and is exceedingly suggestive of isolation and darkness. The low, hot coast line running almost all the way round the continent, with tropical and subtropical vegetation, and the cliff faces of the hills cutting off the sea boards littoral from the interior, suggest prolific growth, wealth and fever.

The plateau-lands desiccated, probably full of underground waters in the North and South; the high fertile plateaux of the interior, close, hot, wet, clothed in many places with rank high grass or dense forest, with wide swamps of the great internal river waters making their way through great lakes (the lakes mainly lying in one line from North to South), and bursting with giant leaps to the ocean surrounding this great and interesting land.

The history of the peoples of Africa is interesting and important; yet although great strides have been made during the century to elucidate the problems connected therewith, it must be admitted that up to the present time the results are more like scientific guesses than sound deductions upon which we can rely. There are few industries to be found, and the bases of the commerce of the continent are, and for a long time to come most probably will be, the natural products of the land and waters. The products, for instance, of the forests—woods, nuts, and gums; the products of the chase—hides, teeth, horns, and feathers; the products of natural deposits, as salt and guano; the agricultural products of seeds—fruits, and the lately-introduced and hopefully extending cultivation of cotton, coffee, tea, and cereals; and the rich products of the mines—gold, silver, lead, diamonds, coal, and copper.

And yet, after all, the poverty of the land is strikingly obvious. The people want little, for there is but little to be had, and the conditions of life on the whole are so uncertain to the individual that reserved wealth is not possible. The wants and their supply are nearly equal, and both are mean. The introduction of the European Directorate may do good, or it may be a great evil. If all the petty jealousies of Europe and America are to be transferred to Africa, and are to be fought out on the African chessboard, with the natives as pawns, then will the case of

the native be a hard one indeed. But if the presence and power of the European and American can secure for the people of Africa peace and security for private property, the opening of communications, the conduct of trade (by barter, of course, in the first instance), the enforcement of a sanitary regime, and the teaching to the African so much of the lore of the white man as he may be able to assimilate for the purpose of his advancement, to the encouragement of industry, the security of his earnings, the honesty of commerce, the keeping out the white man's vices—then will the white man's direction and guidance be a happy thing for Africa, and the time will not be long before the African will be able to do all that is necessary for himself without outside interference, and the European may hand over to the regenerated African the control of his own destiny.

But will this be? It seems somewhat doubtful. "Ham shall be his servant" seems to be writ large and the issue is painful to think of.

The continent of Africa, as we look upon the map, is striking from two points of view—the massive character of the continent, and the great simplicity of its construction. Fifty years ago the map showed us an outline—the River Nile, a few imaginary lakes, the great desert, and an interior on which was the legend 'undiscovered,' with the Mountains of the Moon, run at the caprice of the map-maker, like a huge caterpillar crossing a leaf. And although that is now all changed, yet the great simplicity of the physical aspect of the continent still remains.

And what a mass of land it is! Lying to the west of Asia and to the south of Europe, with a breadth in its widest part almost equal to its length, it stretches through 71 degrees of latitude. From Cape Ras el Kerun in latitude $37^{\circ}20'$ N. to Cape Agulhas (The Needles), latitude $34^{\circ}47'$ S. is nearly 5,000 miles, and from Cape Verde long. $17^{\circ}33'$ W. to Cape Guardafui (or Ras Assir) long. $52^{\circ}22'$ E. is nearly 4,600 miles, or nearly 70 degrees.

Almost in the centre runs the line of the Equator, marking the tropical and sub-tropical portions, whilst north of the Tropic of Cancer and south of that of Capricorn, lie the temperate regions.

This vast bulk is difficult to conceive. The mere statement of the fact that the area contains 12,000,000 square miles does not much help. The United States contains 3,557,000 square miles, nearly the size of Europe (3,700,000). Africa is therefore about three times the size of either Europe or the United States. A straight line from London to Constantinople measures about 1,200 miles, and one from New York to San Francisco about 3,000 miles. This may be compared with the 5,000 or 5,600 miles from Cape Ras el Kerun to Cape Agulhas. Or, take another illustration. If Africa was lifted up bodily and placed across the Atlantic with Algiers touching the West Coast of Ireland, we might then look for Cape Town some hundreds of miles to the west of the City of Chicago.

The very simplicity of the land and water features of the continent adds to its grandeur. A low seaboard from a few to 150 miles in width leads to the hills, and mounting up these on the lower Atlas, Western Africa, the Karoo of the South, or the Eastern shores, the edge of the great basin is touched, which hides and has hidden for ages the hydrographic puzzle of Africa.

Livingstone likens Central Africa to a saucer turned upside down, the rim being the summits and looking down to an upraised plateau region scored with the waterways draining the area, and finally plunging in almost every instance down cataracts into the lower level; the seven cataracts of the Nile, the Yellala Falls, and the Victoria Falls being familiar instances to all.

North of the Atlas and south of the Zambesi, and on certain dry uplands, a South European vegetation can grow and Europeans can live. The two great deserts—Sahara

and Kalahari—mark the boundary of the black man; and at present it seems that within those boundaries it is not possible for other than negroes and Arabs or half-cast Arabs to live and prosper.

The Moor in the North and the European in the South are intrusions, and Nature seems to have set the limit to their permanent boundary. On the East, Arabic races have long dwelt in the land, and centuries have been passed in their acclimatization, but so far, not very far, from the coast, and the splendid broad forest region, made known to us and described with so much eloquence by Mr. Stanley, is still the home of the aboriginal and the negro.

The great cleft, striking South and North through the Nyasa, Tanganika, the great lakes, and down the Valley of the Nile, with, at almost right angles the Zambesi on one side and the Congo on the other, makes the hydrography exceedingly easy to understand. Whilst the great desert, the abode of dryness and of heat, which stretches from the Atlantic through Arabia, Persia, Turkestan, to the great desert of Gobi, is an astonishing but an exceedingly simple thing to understand. This desert may be a reserved land for man's needs in the future. When science has enabled the underground waters to be brought up to and used on the surface, in future times, then the desert may smile and be glad, and be as fruitful as the Garden of the Lord.

The islands of Africa are few and unimportant. Madagascar seems to be a fragment from another land, and besides that, the small clusters on the West, and in the Red Sea, and the Coralline Islands by the East Coast, there are none of any consequence.

Africa differs from Europe in its relatively smaller and unbroken coast line,* in its lack of promontories, and in its huger bulk.

There is land enough in its 12,000,000 square miles to make 100 countries of the size of Great Britain and Ireland.

The inhabitants may be reduced to a very few families—the Bantu stretching under various tribal names from Natal in a North-Westerly direction to the back of Sierra Leone; the Somali and the Galla with the Semites to the North of them in Abyssinia and the Soudan and Egypt: with the older people in Egypt, the Copts. Then the Berber, and the Moor in Algiers and Morocco; and South of Morocco, the Filani, the Mandingo and the Hausa. The diminutive people, the Hottentot, the Bushman, and the Akkas fill almost the whole record.

And the religions of the people may be as summarily dealt with—Paganism in gross forms; a base Christianity in Abyssinia and in Koptic Egypt; and a growing Mohammedanism completes the sad picture.

The history of the Continent has been wonderfully clouded. Whilst we are struck with wonder at the evidences of a (in very early time) somewhat advanced civilization in one corner (Egypt and Tunis), and with lesser evidences in Abyssinia and Mashonaland, the great bulk of the country was twenty years ago practically guessed at rather than known. The beginning of the century marks the serious effort to penetrate its mystery. Every nation has given of its sons to this work.

Just as to-day there are more than eighty religious societies with agents in Africa from every European country, and from America, so in the past the nations have been represented in its explorations and opening out.

From the North, the West, and the East, trials were made with varying success, generally with little, and it was not until that great and good man—one of the best

* The coast line of Africa is 16,000 miles, or an average of 1 mile of coast to every 750 square miles. The coast line of Europe is 19,500 miles, or an average of 1 mile of coast to every 190 square miles of area.

friends Africa ever had Dr. Livingstone—cast forth from his moorings from near the Kalahari and struck North and West, then West and East, that the great work was on the way to be finally crowned.

Of the eight hundred explorers who are known to have tried to penetrate the darkness, between 1800 and 1850, quite six hundred left their bones on their wander-track in Africa, or died immediately on return home.

The splendid work of the Missionary is found in every part; men who have freely and lavishly given their lives, and are now giving them to help the people, to make known to the world outside the needs of the African.

Europe and America owe the African a heavy debt. See what has been given to them—Slavery, or a worse form of slavery than they had before—firearms, drink, disease, and bad example; and Europe and America are trying to liquidate some of the terrible debt set against them by the African.

Political annexation may or may not do them a service. But patient leading, generous guidance, a healthy and honest trade, and—should I not say it?—a holier example of living will. Such lives as Vanderkemp's, Moffatt's, Livingstone's, of Fox, of West Africa, Grenfell, and the host of devout men and women whose lives have been, or are being, spent for them, will all be needed before the time shall come when "Ethiopia shall stretch out her hands to God."

The Conference at Chicago may give such an impetus to this work in lifting it above paltry political and sectarian jealousy, in banding together all those whose hearts are in the work, that a great flood of illumination may be poured forth on the Dark Continent and till the Watchman shall be able to trumpet forth, "The Morning Cometh!"

Emigration to Siberia and Navigation on its Rivers.—According to the *Russian Official Messenger*, the emigration from European Russia to Siberia has lately been increasing as follows. The number of immigrants who have passed through the government of Tobolsk was—

1885	9,680	persons
1886	11,830	"
1887	13,910	"
1888	26,129	"
1889	30,140	"
1890	36,000	"
1891	60,000	"
1892	100,000	"

A certain number of emigrants take moreover the southern route, *via* Orenburg. As to the transport of goods by steamer which ply between Tyumen (the terminus of the Ural Railway) and the chief towns of South Siberia on the Obi and the Irtysh, the traffic did not exceed 40,000 tons in 1886. It has been steadily increasing since, and attained 97,000 tons in 1889, 145,000 tons in 1891, and 258,000 tons in 1892, the total traffic on the rivers of West Siberia being over 320,000 tons. The first steamer began to navigate in West Siberia in 1844, and it remained single till 1854. There were, however, ten steamers in 1860, twenty-two steamers in 1870, thirty-seven in 1880, sixty-five in 1890, and one hundred and two steamers, with two hundred barges and boats, in 1893. The old-fashioned steamboats are disappearing, the tendency being to have powerful tug-boats (150 to 250 horse-power) with full accommodation for passengers. The freights are, however, still high, and attain twenty to twenty-five copecks (5d. to 6½d.) for the *pod* (36lb.), and for a distance of from 1,800 to 2,000 miles—that is, they are six to seven times higher than on the Volga.—*The Geographical Journal Monthly Record*.

NOTICES OF BOOKS, &c.

CAMINHO DE FERRO DA BEIRA A MANICA. Excursões e estudos effectuados em 1891. Sob a direcção do Capitão de engenharia, J. RENATO BAPTISTA. 4to, 114pp. Fourteen views from photographs, and map and index. *Lisboa: Imprensa Nacional*, 1892.

THIS is a very interesting report of the surveys made for the laying down of the railway from Beira towards Fort Salisbury, which has some portion already opened for use. It is from the coast one of the shortest lines possible, and as the railway already crosses the malarious districts, it should play a great part in the opening out of Mashona and Matabele lands. Beginning with a short historical review (from the Portuguese point of view) of the region, then giving a description of physical characteristics of the region and the practical work of the surveyors, and finishing with some of the writer's conclusions and a short orthographic chapter.

It is well for us to read a book like this and see how differently, from an altered point of view, a country may look.

Had the doctrine of the "Hinterland" prevailed here, the claims of Portugal to Central South Africa would have been irresistible, and there is a tone of disappointment that the share of Portugal should have been so curtailed.

The book is valuable as a contribution for the use of the future historian of what must become, in a few years, a thickly-peopled and great industrial community. The precious metals, which have been so lavishly spread over the higher lands, and the vast agricultural capabilities only waiting to be developed, will make this book of very great value as an eye-witness of the state of things in the earlier time.

We are much indebted to the Lisbon Geographical Society for adding this volume to the treasures of the Library.

BRITISH EAST AFRICA, OR I.B.E.A. A History of the Formation and Work of the Imperial British East Africa Company. Compiled, with the Authority of the Directors, from Official Documents and the Records of the Company. By P. L. McDERMOTT, Assistant Secretary. Preface by A. B. KEMBALL, Chairman of the Court of Directors. Map, portrait of Sir W. Mackinnon, illustration of granting letters of freedom to 1,422 slaves, appendices, and index. *London: Chapman and Hall*, 1893.

THIS is an important publication, clearly written, easy to read, and containing the very kind of matter which those who are interested in East Africa often want but find it somewhat difficult to obtain.

But the book is more than that: it is a justification of the work done by the company, and constitutes an appeal that the benevolent work they have begun shall be brought to a completion. Mr. McDermott is in this case, therefore, a special pleader. Beginning with an introductory chapter dealing with the control of Muscat over the East Coast, our intervention, and with the subsequent events to the German descent on the coast, and the new arrangements between England and Zanzibar.

In fourteen following chapters he relates the causes leading to the origin of the company and the work done by the company to the recall of Captain Lugard. He points out that the advance of the company to Uganda was forced upon them, and makes a strong point in that the territory of the company is still included in the Free Zone of the Berlin Congress, whilst Germany has withdrawn her territory and is able thereby to levy taxes to pay the cost of her administration. If this is allowed to pass, it would seem to be unfair to the company.

The several appendices are valuable, including proclamations, treaties, letters and replies to and from the Government, and are essential documents for the understanding of the important question of East Africa.

The volume is of very great value, therefore, and will become much more valuable in time to come.

UNIVERSITY EXTENSION MANUALS. Introduction to Modern Geology.

By R. D. ROBERTS, M.A., University Lecturer on Geology in the University of Cambridge, &c. 270pp. Illustrated with coloured maps, diagrams, and tables, a geological map of Great Britain, a section from Snowdon to Harwich, and an index. *London: John Murray.* Price 5s.

THIS book, the substance of the Extension Lectures previously given by Mr. Roberts, is most interesting, dealing with the geology of England as an epitome of the geology of the World, and giving, in the course of eighteen chapters, "a sketch of the methods and chief results of geological enquiry, such as a reader interested in the subject for its own sake desires to obtain."

The print is clear and not overcrowded; the maps are, unfortunately, too small to use without being very trying; but the book will be welcome.

The chapters on the "Evolution of Land Areas" and the pages devoted to the part played by water in the shaping of the Earth's surface are particularly interesting.

The chapters are: Progress of Geological Thought, The Beginning of the Earth-history, The Agents of Destruction, Estimates of the Extent of the Destructive Operations, Shallow-water Deposits, Calcareous Deposits (Coral Reefs), Deep-sea Deposits, Movements of the Crust, Volcanic Action, Classification and Interpretation of the Stratified Rocks, The Aqueous Rocks and Deposition in Past Times, The Igneous Rocks and Volcanic Action in Past Times, Evolution of the British Islands, and a chapter giving a Summary of Conclusions.

On page 64, Mr. Roberts states: "The area of Great Britain is 90,000 square miles [and he takes that figure to represent the amount]; 143 tons removed from every square mile [the figures arrived at] make a total of over twelve and a half million tons of material carried down in invisible chemical solution to the sea every year by British rivers."

Looking at the work done by the rivers of the world, Mr. Roberts says: "The mind stands paralysed in the attempt to realise the work done by all the rivers of the world in this silent and unceasing way."

Estimates are given of the deposit carried by the rivers Rhone, Rhine, and Danube, in Europe; the Brahmapootra, Ganges, and Yellow River, in Asia; the St. Lawrence and Mississippi, in America; and the final result is indeed stupendous.

Those who are interested in geology in its relations to geography will be glad to have so well-written and interesting a handbook as this Manual.

HANDBOOK OF BRITISH EAST AFRICA; including Zanzibar, Uganda, and the Territory of the Imperial British East Africa Company. Prepared in the Intelligence Division, War Office, 1893. *London: Harrison and Sons.*

THIS useful handbook is published at a most appropriate time. It contains the following chapters: General Description of British East Africa, Ethnology and Philology, Climate, Zanzibar with Pemba, Coast of Mainland, Central Region, Kittara or Lake Region, Uganda, History of Uganda, Countries Adjoining Uganda, Northern Region, Communications and Travel, History of British East Africa, Exploration of the Interior, Products and Trade, and Works of Reference; and is illustrated with Maps of Southern Portion of British East Africa, a Skeleton Map of North-East Africa, the Islands of Zanzibar and Pemba, Mombasa Harbour, and a reduced reproduction of the Survey made for the proposed railway, showing routes into the interior.

The chapter on Uganda was published in our *Journal* (Vol. viii., pp. 266), and the publication of this book is most opportune.

The type is of good size, the matter is clearly set forth from an independent standpoint, and the maps add very much to the value of the handbook. There is a table of contents, but no index. The latter would have added very much to the value of the book for ready reference. We are, however, thankful to obtain an authoritative and able statement of the facts in relation to this great portion of Africa.

"ATLAS DE GÉOGRAPHIE HISTORIQUE." 54 double-sheet maps printed in colours, with historical text printed on the back of the maps, and a great number of detail maps, figures, and diagrams. Edited by F. SCHRADER, and published by *Hachette and Co., of Paris and London.*

THE atlas can be bought in numbers, each number containing three maps, price 1.50 francs. The complete atlas will cost 30 francs (in sheets), or bound 35 francs.

The contributors to this atlas are a company of distinguished French geographers—MM. Schrader, Debidour, Maspero, Hauesoullier, Guirand, Longnon, Diehl, Blondel, G. Marcel, Bernard, Waddington, and others.

The atlas is printed in colours and is very carefully done; the text is, of course, in French, and an index will accompany the complete work.

When the atlas is complete it will be of considerable value; each of the geographers dealing only with the country of which he has made a special study. The type is clear, and the maps are beautifully printed.

GENERAL MAPS FOR THE ILLUSTRATION OF PHYSICAL GEOGRAPHY.
Prepared by AXEL STAGGEMEIER, of Copenhagen. Part I. Five
Maps. *London: Edward Stanford.* Price 8s.

THESE maps are intended to be used for marking the line of travel and voyages, facts in Natural history, meteorological notes, and of the numberless purposes for which they are well fitted for modern scientific enquiry.

It might have been better if the land-line had been a little stronger; it is very light, and becomes somewhat confusing.

The maps are accompanied with an explanation quaintly done by one who is not a master of the English language, and sometimes it is almost impossible to get at the exact meaning.

The idea of Mr. Staggemeier is a very good one and is well worked out, and the maps can be used in many ways to great advantage.

Two of the maps represent the poles, and are drawn on "a central projection." Three of the maps, on Mercator's projection, are of the middle latitudes of the Atlantic, Pacific, and Indian Oceans.

The whole set of maps will be complete in six parts, this first part consisting of five maps. The whole work will contain twenty-five maps.

If the North Polar Map is taken, it will be very easy to follow all we hear of Nansen's voyage, and to mark his course and have a journal of progress, which it will be interesting to compare with the actual log of the "Fram," and in many other ways, the maps will commend themselves to geographical workers and will be of great assistance.

A MAP OF MASHONALAND, MATABELILAND, KHAMA'S COUNTRY, &c. The
British South Africa Company's Territory South of the Zambesi,
1893. Two sheets, size 52 by 38 inches. Scale, 16 miles to an
inch. Price: Two sheets, coloured, 8s. *London: E. Stanford.*

THIS map has been compiled from surveys made by and under the direction of the officers of the British South Africa Company, together with the numerous and valuable route maps and sketches made by Mr. F. C. Selous, sketch surveys by officers of the British Bechuanaland Police, and observations and route surveys by Mr. Swan and others.

In it is embodied the magnificent route surveys and observations made by the late Thomas Baines, the pioneer in the search for gold in Mashonaland.

A part of the Shiré Highlands, including surveys by Joseph Thomson and Lieut. Selater, comes within the limits of the Map.

The course of the Beira Railway, the telegraph lines from British Bechuanaland through Palachwe to Tuli, Victoria, and Salisbury; the telegraph lines in the lower Shiré and Zambesi; the Pioneer Road to Salisbury, and the Selous Road from Salisbury to Umtali and Chimoio are all correctly laid down.

The map also gives the names and positions of the principal reefs in the various goldfields that are already in course of development. Altitudes are given in feet above the level of the sea.

This map is the latest and most complete of these lands, and is quite indispensable for those who have business, or who take an interest, commercial, religious, or political, in these countries.

It is in many ways a most interesting document and is full of information.

It will become of great value in the future as a map of reference, in view of the great changes pending in this part of Africa, and its publication is most opportune.

ATLAS OF INDIA. Containing sixteen maps and complete index, with an introduction by Sir W. HUNTER, K.C.S.I. Size of each map 14in. by 12in.; folded, full-bound cloth, size 12in. by 8½in. Price 7s. 6d. *W. & A. K. Johnston, London and Edinburgh.*

THIS atlas has been prepared to meet the requirements of the student, tourist, soldier, educationalist, man of business, and the missionary. The Government Survey "Indian Atlas" has formed the basis of the maps; the last editions only have been used. For more recent information the "Imperial Gazetteer of India," by Sir W. W. Hunter, has furnished reliable data. The letterpress, which has been specially written for this work by Sir W. W. Hunter, who is the greatest living authority, gives a general, physical, statistical, and historical introduction to each plate.

The atlas contains 16 plates, 14 of which deal with the various provinces; they are all on one uniform scale of 50 miles to an inch, whilst the plans of towns are on the scale of one mile to $\frac{3}{4}$ of an inch. The physical features are clearly represented. The rivers, canals, and lakes, with all names referring to water, are printed in blue, the hills in brown, and names in black; the provinces and districts are represented in various colours, and chief highways and all railways are indicated. Towns and villages are inserted according to population, which is shown by symbols and lettering. An index map assists in the finding of any required district, and an extensive index completes the work. The spelling of names in the atlas is copied from Sir W. W. Hunter's "Imperial Gazetteer of India."

The following are the maps contained in the atlas: An Index Map and detailed Maps of Lower Bengal; North-West Provinces, Oudh, and Nepal; Punjab (East), and Kashmir; Punjab (West), British Baluchistan, and North-Western Frontier; Rajputana, and Ajmere-Merwara; Central India; Central Provinces; Haidarabad, and Berar; Bombay (North), and Baroda; Bombay (South); Madras (South), Mysore, and Coorg; Madras (North), South Ori-sa, and Ceylon; British Burma (North), Assam, and Manipur; British Burma (South), Andaman, and Nicobar Islands; Plans of Calcutta, Madras, and Bombay, and also insets of Aden and Environs, and Perim Island; and a complete index to all places mentioned in the atlas.

The atlas is handy to use, is well printed, and being on a scale of 50·9 English miles to the inch, the maps are not too small for comfortable reference.

It will be found a most useful book of reference, and is an admirable atlas (at a reasonable price) of the great dependency of India. There are two maps of Burma.

THROUGH MATABELELAND: The Record of a Ten Months' Trip in an Ox-Wagon through Mashonaland and Matabeleland. By JOSEPH GARBETT WOOD, M.L.A., Colonel of Colonial Forces. 198pp., maps, plans, several illustrations, and portraits of Author and of Lobengula. *London: Richards, Glanville and Co., 1893.*

THIS is an account of the adventures of the Wood, Francis, and Chapman syndicate in Matabeleland. It consists of the usual adventures, and contains a most interesting account of the daily life at the kraal of Lobengula.

The writer was a member of the Cape Legislative Assembly, and died soon after the publication of the book.

The syndicate seems to have obtained one of the concessions granted by the king, but became useless, and hard things are said of the Rhodes' Company.

The account of the industrious Mashonas and of their terrible sufferings at the hands of the Matabele is of value, as it is the evidence of an impartial witness.

The book is of value in relation to the character of Lobengula, and the evidence that the king was not always successful in compelling his indunas to obey his will.

Now that the reign of Lobengula is passed, the descriptions of the king, his court, his army, the mode of life, the raids of his impis, and all that went to make up the sum of this example of savage life is of interest, in view of the rapid changes which will now come over these countries.

An appendix contains "a few hints to travellers" and distance tables, and copies of official correspondence. There is no table of contents and no index.

The journey was made in 1887, but this account of it was not published until 1891.

A JOURNEY THROUGH THE YEMEN AND SOME GENERAL REMARKS UPON THAT COUNTRY. By WALTER B. HARRIS, F.R.G.S. Demy 8vo., 386pp. Table of contents, index, twenty-four full-page illustrations, and twenty-four illustrations in the text from Sketches and Photographs by the Author, and three maps. The book is divided into sixteen chapters, and a genealogical appendix of the Imans of Sanaa, and the pedigree of the reigning Abdali, Sultan of Lahej. *London: Wm. Blackwood and Sons, 1893. Price 16s.*

THE chapters of the book are headed—

Part I.—Some general remarks on the Yemen : (1) The Yemen. (2) The Yemen before the Hejira. (3) The Yemen since the Hejira. (4) The Influence of Islam in the Yemen. (5) The Rebellion in the Yemen.

Part II.—A Journey through the Yemen : (1) Aden. (2) Aden to Labej. (3) Lahej to Khoreiba. (4) Across the Turkish Frontier. (5) Sobeh to Yerim. (6) Yerim to Dhamar. (7) Dhamar to Sanaa. (8) Sanaa, the Capital of the Yemen. (9) Sanaa to Menakha. (10) Menakha to Hodaidah. (11) Hodaidah.

This is a record of a somewhat adventurous journey, which was brought to a sudden end.

The country into which Mr. Harris ventured is very little known, but is of very great interest.

The historical relation is valuable, and the incidents of the travel are sometimes amusing.

By permission of the publishers we print a few of the illustrations, which will give some idea of this strange region.

The late revolt against Turkey has given rise to a desire to know more of South Arabia. Mr. Harris's book and the work of Mr. Theodore Bent, who is exploring further east, will open up to us some knowledge of these closed countries.

After reading the book, we can very well sympathise with the writer in his closing words—

"A year has passed since I left the country, and yet its every detail is as clear to me as if it had all happened yesterday.

"As I lay down my pen I conjure up in my mind the desert-rides under a myriad of brilliant stars ; I feel upon my cheek the soft, balmy, southern breeze. I see again

our little party hiding in the gullies, and creeping on by night over the terrible rough roads of the mountains.

"Once more, warned by an unknown friend, I escape by night from Beit Said. Once more, but this time with a smile, I spend five days a prisoner in the CONAK of Sanaa.

"Once more I pass through the great valleys and descend to the desert, and I shudder over the remembrance of nights and days of fever—a fever that clung to me for months.

"Yet my recollections of the country are ones that I shall always treasure; and in spite of dangers and sickness, in spite of long marches and days in prison, the Yemen will always be for me, at least, Arabia Felix."

If the book is taken up to read, it will not be put down until the last line is read.



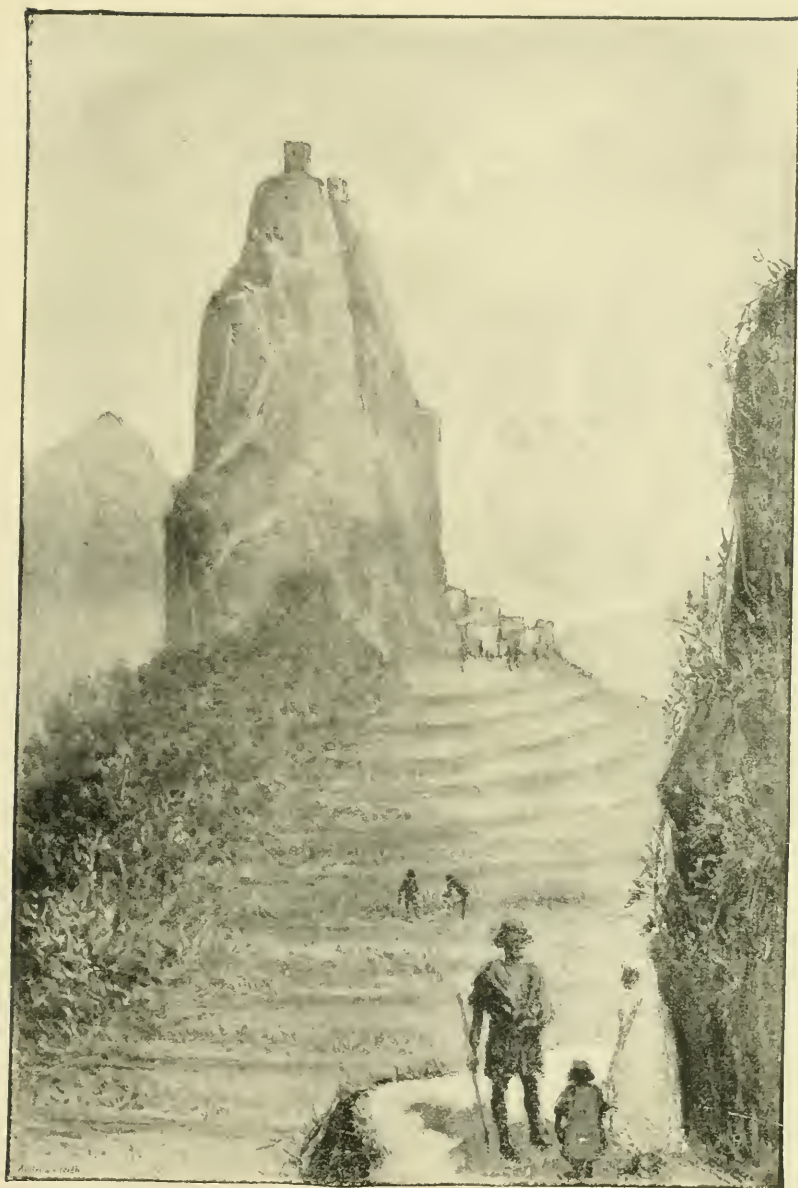
JEW OF THE YEMEN (page 82).

The following is the list of illustrations lent by Messrs. Blackwood and Sons :—

- No. 1 * (page 8). Coffee Plantations, showing terrace cultivation.
- No. 2 (page 60). Howta, the Capital of Lahej.
- No. 3 (page 68). A Native of the Tehâma.
- No. 4 (page 78). A Yemeni.
- No. 5 (page 82). A Jew of the Yemen.
- No. 6 (page 162). Palace of the Sultan of Lahej.
- No. 7 (page 282). Jibel Doran, Early Morning.

"The Jibel Doran, a range of mountains of great elevation, which terminate in a strange, sugar-loaf peak, unequalled in curious form by any I have seen elsewhere in the world, with the exception perhaps of the 'Needle of Heaven,' in the I-Chang gorge of the Yang-tze-Kiang."

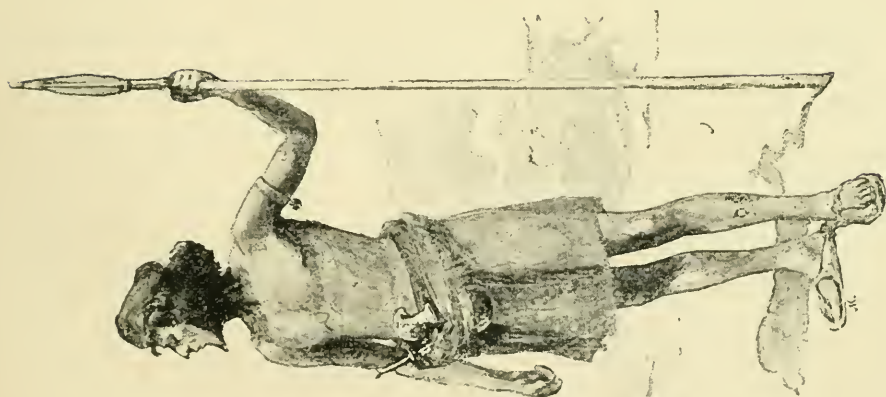
* The pages given refer to the pages in the book.



COFFEE PLANTATION ON TERRACES AT ATTARA, NEAR MENAKHA (page 8).



HOWTA, THE CAPITAL OF LAHEJ (page 60).



A NATIVE OF THE TEHAMA (page 68.)



A YEMENI (page 78.)



JIBEL DORAN—EARLY MORNING (page 282.)

THE RISE OF OUR EAST AFRICAN EMPIRE: EARLY EFFORTS IN NYASALAND AND UGANDA. By CAPTAIN F. D. LUGARD, D.S.O., Hon. F.R.G.S. With 130 illustrations and 14 specially prepared maps. Two vols., large demy 8vo. Contents table to each volume, index, 14 pages of introduction, and 1,246 pp. Price, 42s.

THESE are handsome volumes, as far as regards the printer's and binder's arts. The illustrations are interesting, and the maps prepared by Mr. Ravenstein are very valuable.

The chapters dealing with the earlier life of Captain Lugard with the army in India, and his hunting experiences, will appeal to a large class.

The story now fully told of the great fight at Karonga's will create admiration for a gallant band of Britons who made, in the end, a successful stand against Arab and native slave dealing at tremendous odds, and who virtually saved this part of Africa from the hands of the ruthless despoiler and handed it over to the more peaceful agencies of the missionary and the trader.



SWAHILI (page 239, vol. 1.).

The sketches of life and travel in Uganda and the neighbouring territories are full of strong and abiding interest.

It is seldom that the founding of a great empire is revealed to us so fully and graphically as is here set forth by one who has taken so great a part in the work.

These volumes are absolutely necessary to those who wish to understand the magnificent opportunity for British development, and the problems raised no less show the enormous task set before this country in the carrying forward of this object.

Ignorance on the subject has perhaps hitherto been pardonable from the exceeding difficulty of collating the various official papers on the subject. But in these two volumes, not only the official point of view is given but there is placed most vividly the point of view of those who in most difficult circumstances and supported in a half-hearted way have had to look at matters as they have opened out.

The volumes also show that it is not impossible, by dealing with the natives fairly, honestly, patiently, to acquire their confidence and support.

At the same time it is quite manifest that the one essential to success in these countries is firmness and a straightforward, continuous policy.

The cattle disease has broken the power of the terrible Masai, and circumstances appear to be now favourable to the development of settled peoples, unembarrassed by the wandering and marauding cattle lifters—a condition of primary importance to the well-being of the native tribes.

With peace assured, and so much government as is needful to ensure a peaceful issue of tribal disputes, with roads made quite safe, and perhaps railways opened through the country, the people will settle down to cultivate and open up the millions of acres of vacant territory, and smiling villages, with towns arising round



NZOI PEAK—THE GATE OF CENTRAL AFRICA (page 316, vol. i.).

the detached forts and mission stations, will take the place of the desolation caused by tribal raids and the fearful destruction of slavery.

This is already partly accomplished and must go on.

No doubt, as Captain Lugard very properly points out, difficulties of other kinds may arise, partly arising from the disputes of white men, but these must not be allowed to stand in the way of the peaceful advance of these half-civilised races and powerful nations.

Captain Lugard's book is one that will for a long time be a book of reference, and must enter very largely into any future history of these transactions.

For himself he has little to say; he leaves his own story, like so many brave Britons, to be told by others, who know him best and admire his modest, quiet, persistence. He has at least realised the efficacy of "pegging away," and, as the story is unfolded, he shows that he and his small band of gallant men have pegged away to some purpose.



MLOZI (page 77, vol. i.).



DR. D. KERR CROSS (page 68).



DR. LAWS (page 83, vol. i.).

We wish every member of the Society could read these volumes ; the reading would enlarge their vision, engage their sympathy, and rouse them to "high enterprise."

We have selected a few passages from the volumes which may lead the members to make closer acquaintance with them.

The chapters on the products, trade, commercial possibilities, modes of communication, the game, the descriptions of the people, the question of slavery in its several forms, and the various official documents placed before the reader, are invaluable for a true conception of the great question—the opening, settlement, and development of the British sphere on the East Coast.

Captain Lugard tells the story of the war with the slave dealers at the north end of Lake Nyasa.

THE ORIGIN OF THE WAR—SLAVE TRADE AND MISSIONS.

"The story of the origin of the war was as follows : Some six years prior to the time of which I write, the African Lakes Company had founded a small trading station at Karonga's towards the north-west end of the Lake Nyasa. About the same time a small party of slave-traders settled in Mpata and built their villages seven miles from Karonga's on a very important site, which commanded the road to Tanganyika by controlling both the ferry of the river and a pass. They had few followers, and settled here by the permission of the local tribe, the Wankondé—a peaceable agricultural people, who were also rich in cattle. For some time all went well. Soon the Slavers made excuses for putting an enclosure round their village, on the plea of the fear of lions, &c. This gradually grew into a stockade.

"The Nkondé valley was a singularly peaceful spot, shut in by ranges of high hills from the warlike tribes around. It was extensively cultivated by the industrious people, and the far-reaching banana groves were kept in scrupulous order. The Wankondé are very clean in their habits, and their huts are the neatest and most wonderfully built of any I have seen in Africa, excepting only the houses of the king and chiefs in Uganda. Settled among the Wankondé were an alien tribe, named the Wahenga. These people had fled before the powerful and dreaded (Zulu) tribe of the Angoni, and had claimed and received the hospitality of the Wankondé, who allowed them to live among them. Though inferior in numbers, they were superior in fighting capacity to their hosts. With these people the Slavers now began to intrigue. The Wankondé were armed with nothing but spears. The Wahenga had the guns of their allies, who promised them the land if they would assist them to drive out and enslave the Wankondé. They readily agreed, and fire and sword was carried from village to village. The men were shot down, and the women and children carried into slavery, to be sold for fresh supplies of guns and powder, wherewith to enable the Slavers to make still more extended raids.

"At length these barbarities culminated in an act of singular brutality. The Wankondé who had fled were decoyed by promises of peace and friendship to a place near an arm of the lake called the Kambwé Lagoon. The banks of this bay were fringed with dense reeds, now dry in the hot weather ; its shallow water swarmed with crocodiles. The wretched Wankondé were treacherously attacked, and volley after volley was fired into the dense crowds of men, women, and children, who had fled to conceal themselves in the reeds. To these the Slavers set fire, and gave the wretched people the option of rushing into the bay to be devoured by the crocodiles, or of being roasted alive, or of coming out to be shot down wholesale, or captured and enslaved, while their assailants climbed the trees to watch the butchery, and fire with more advantage on the terrified masses among the reeds.

"The Slavers now having overrun the whole country up to the very gate of Karonga's, their leader, Mlozi, proclaimed himself Sultan of Nkondé, and demanded acquiescence and the payment of a tribute from Monteith. This the latter refused. The 'Arabs' now daily began to throw off any disguise of friendship for the white men, and to use insulting words, and even openly threatened that the turn of Karonga's was soon to come."

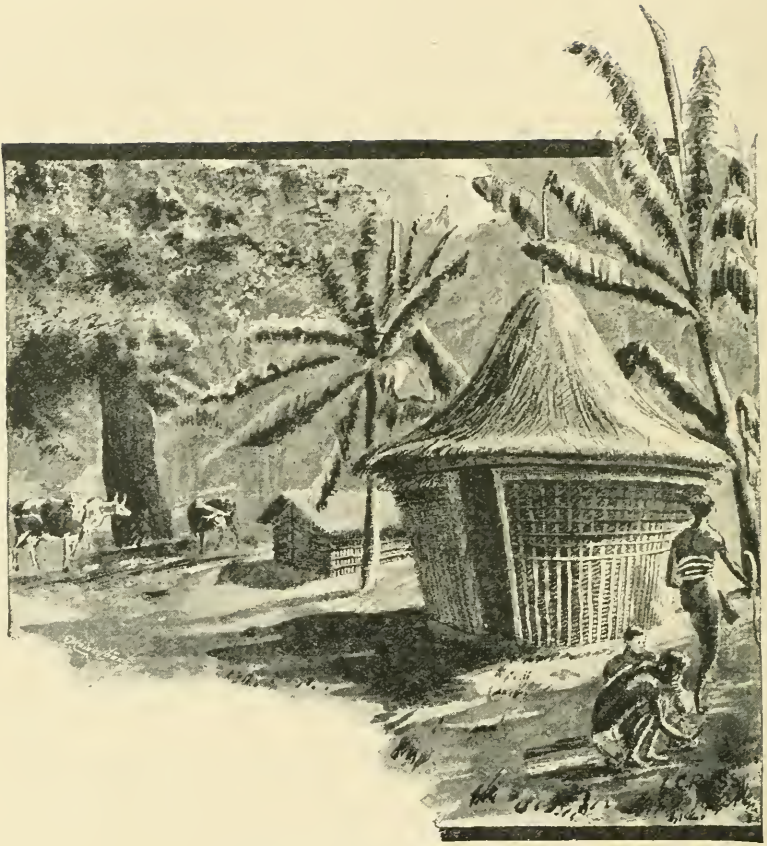
A few words on the Slavers themselves are instructive.

THE SLAVERS.

"A word as to who and what were these Slavers, against whom our little campaign was directed. I shall distinguish in a subsequent chapter between the two main divisions of slavery—the domestic institution, and the acquisition of raw slaves to meet the demand at the coast. This demand is met by slave-trading or slave-raiding. Of the latter I will say a few words here, in order to explain to my readers the character and methods of our present antagonists. I have already told of the incidents which led up to the fighting at Karonga's, and the story is a typical instance of the *modus operandi*. At first, a slave-trader comes as a friend, and settles down in the country by the permission and with the goodwill of the natives. He calls himself a Mzungu (white man), and the deference he exacts from his followers invests him with the appearance of being in reality a great chief. His dress, and his guns and powder, his calico and his goods, cause the savage chiefs around to look on him as the representative of an unknown power—and, indeed, in all these respects his prestige is founded on precisely the same basis as that of European settlers. He is on terms of familiarity with his chief men, who eat with him, and with whom he discusses his plans. His language, Swahili, is soon acquired by his followers, whose native tongue is probably closely allied to it. His friends, the surrounding chiefs, are treated hospitably by him, and buy his cloth with their ivory. There is not so great a gulf between him and them as there is between the African and the European; and so it happens that he soon becomes a *beau ideal* to the savage. They imitate his dress, assume his name in lieu of their own; they covet his guns and powder, and are impressed with his absolute power over his slaves.

"He begins by a little slave-trading, perhaps. Savage chiefs can easily procure men, women, and children, and for these he offers cloth or even arms in exchange. Soon he collects sufficient to send a slave convoy to a colleague on the way to the coast, and in return he gets consignments of arms and goods. Meanwhile, he has made himself acquainted with all tribal quarrels, for unfortunately (and almost of necessity where there is no paramount central authority) every tribe is at chronic feud with its neighbours. He espouses one side, and to that alone he sells arms. By-and-by a bargain is struck, and he joins his allies to make war on his neighbouring tribe, who have done him no wrong. His guns and his superior intelligence are irresistible. His share of the booty consists of the captives, and perhaps a *largesse* of ivory as well, and on return from the foray his village is full of slaves ready for export.

"He has now become, not merely the *beau ideal*, but a dreaded power in the land, whose friendship must be won at all hazards by presents of women and ivory. Chiefs are eager to be in alliance with him, and he has no difficulty in recruiting his band of 'Ruga-ruga,' whom he will arm with guns and despatch to raid for slaves. To be enlisted in this body becomes the ambition of the young bloods. Our Slaver need no longer command his forays in person; his 'Ruga-ruga' are his dogs of war, ripe for carnage, revelling in blood. What can any individual chief of a petty tribe do now? The Slaver's foot is on his neck—he must yield to his every demand.



A WANKONDÉ VILLAGE (page 53, vol i.).

Such were the methods by which Mlozi became 'Sultan of Nkondé.' The modes of the Congo slave-raiders appear identical, as I saw on the banks of the Semliki (see vol. ii., p. 177). They have powerful centres (described by Stanley) at Ugarrowa, Ipoto, &c., and from thence they send parties of their trained Manyuema to occupy fresh posts, far afield. They collect ivory, as *hongo* (blackmail), from all surrounding districts, and slaves, whenever they want them, by raids on the neighbouring tribes, establishing their influence and power by the means I have described."

ARAB SLAVERS.

"A final word as to who are these 'Arab' Slavers in the interior. I know no more misleading term than this word 'Arab.' The Bedouins of the Sahara, the true Arabs, a high-bred race of great courage, and often of statuesque beauty; the Sudanese black tribes (the 'Fuzzies,' as they were known to us in the '85 campaign), from whom the Mahdist troops were recruited; the natives of Arabia, of whom there may be a very inappreciable few in East Africa; the conquering race from Muscat in the Persian Gulf, which subdued Zanzibar and the East Coast, and founded the present dynasty; the mongrel, woolly-headed Slaver in the interior, whose mother was some slave-girl, and whose sire may have been fortieth cousin to a Muscat Arab—all are alike called 'Arabs,' yet they differ as much among themselves as they individually do from the 'street arab' of London. The term 'Arab,' therefore, in East Africa, should rightly be applied only to the pure-bred descendants of the invaders from Muscat."

Perhaps the description of the Swahilis may be new to some :

THE SWAHILI.

"A word in passing as to who these Swahilis are. In the year 1698 the Imaum of Oman sailed from Muscat, in the Persian Gulf, and conquered Zanzibar, which henceforth became a dependency of Muscat. The East Coast of Africa gradually fell under their dominion, until (after constant friction) the Sultanate of Zanzibar became an independent power, and was recognised by Great Britain as such. These Muscat Arabians (or Persians) settled along the islands and the coast of the mainland. Brave and adventurous, they penetrated into the then totally unknown interior, and began that system of slave buying and slave catching which, until their advent, had never assumed such proportions on the East Coast. Boy slaves brought down from the interior, and belonging to various tribes from the Zambesi to the Tana, grew up in their households, and took their ideas from them, and too often their vices and their foul diseases. There was also a percentage of half-breeds, the offspring of Arabs by slave concubines.

"A language grew up, founded on the various tongues spoken by these captured slaves, who usually belonged to the great negro stock, with woolly heads, and flat, boneless noses; for these races, from their splendid physical development and great bodily strength, furnished the best type of manhood for the Slaver's purpose. Moreover their childlike docility and adaptability, and their eager imitation of their masters, made them pre-eminently suitable for slaves. The other races, the Somals, Gallas, Masai, Wahuma (probably of Abyssinian origin), with the Angoni and Magwangara, &c. (of Zulu stock), spoke languages of a different origin, and these have left no mark on Swahili, proving that these tribes were little used as slaves, though doubtless some of their women (being far handsomer than those of the negro races) were brought down for the coast harems. Side by side with the Arabic spoken by the Muscat Arabians, and the dialects of the native tribes, was a third element. Great numbers of Indians from Hindustan—mainly from Cutch and Googera—had migrated to the East Coast of Africa. Though speaking for the most part Googera,

their *lingua franca* was Hindustani. From these three sources the Swahili language took its origin. The construction of the language and its grammar were based on the native languages—tense, mood, person, and location of verbs, number and concord of nouns and adjectives, being all indicated by prefixes to the root, while the vocabulary was largely recruited from Arabic and Hindustani. The words thus amalgamated in the language were naturalised (so to speak) by being made to end in a vowel, and having the accent on the penultimate (as is the case with all Swahili words); they then followed the grammatical rules of the native dialects.

"This language has been called the *lingua franca* of Africa; and the coast population who spoke it became the followers of the Arabs into the interior. Their physique and their origin alike rendered them peculiarly adapted for the task. Taught from their childhood to carry heavy burdens, they bore on their heads the goods necessary for barter in the interior, and the other paraphernalia of their masters, in loads from sixty to eighty pounds. Plucky and delighting in war, they formed under Arab leadership, and armed with guns, an irresistible force in any slave-raiding forays, while their various origin provided the Arab with natural interpreters in almost every country or tribe which he visited.

"Such are the people who call themselves 'Wangwana' or *watu wa pwani* (coast men), and called by Zanzibaris, or Swahilis. The common negroid race from which they sprang has been termed the 'Bantu' stock—the word Bantu (people), or some modification of it, being common to all their dialects. They include, as I have shown, the pure-bred native of the interior (naturalised at the coast), and also every degree of admixture of Arab blood, from the half-breed downwards. Half-breeds would generally be free men, and arrogate to themselves a much higher position than the common Swahili. The large majority, however, are pure natives."

An extract on Mwanga is interesting. Capt. Lugard says:

MWANGA.

"Mwanga had succeeded his father in November, 1884. Early in 1885 he determined to stamp out those dangerous religions, Mohammedan and Christian alike, which were disintegrating his country. The missionaries, Mackay and Ashe, were seized, and their followers persecuted. But the religion spread the more. A plot to depose Mwanga was discovered and crushed. With varying fortunes—sometimes treated leniently, sometimes the victims of violent persecutions—the missionaries held their own till the autumn of 1885. Then came news of Bishop Hannington's approach. Mackay and Ashe assured the king in the strongest terms that he had no intention of entering Usoga, or of coming by that road which was vetoed by the tradition of Uganda; but that his intention was to come only as far as the eastern shores of the lake, and thence to cross to Uganda by water. A boat was sent to take him from Kavironde to the south of the lake, that he might arrive by the usual route. But the bishop had changed his plans, and though Mackay had assured the king he would not enter Usoga, news was suddenly received that he was at Luba's on the Nile, on the very threshold of Uganda. A more inopportune moment could not have been selected, both on account of the persecution then taking place in the country, and on account of the disturbing news from various quarters concerning the aggression of the Europeans, to which I have alluded. Mwanga ordered him to be killed, and he and his men were murdered in cold blood, October, 1885.

"Dastardly as this murder was, it must be admitted that Mwanga looked on Hannington's arrival as the precursor of war; and it was most unfortunate that the bishop should have adopted the route *via* Usoga. After this the position of the Europeans was very precarious, but not till the following May (1886) did the storm



MANDALA HOUSE, MESSRS. MOIR'S HOUSE (page 51, vol. i.).

burst. Mwanga then threw aside all restraint, and butchered the Christian converts wholesale. On one occasion as many as thirty-two were burnt on one pyre : but in spite of martyrdom by torture and burning, the religion grew, and converts came to be baptised, though they knew that the profession of the Christian faith might cost them their lives on the morrow. Those who fell victims to the king's bloodthirstiness died with the praises of God on their lips, and met their death fearlessly. The heroism inspired by religion in the early history of our own Church was repeated here in the heart of Africa, and the story caused a strong feeling of admiration and sympathy among those who heard it in England. Men asked what kind of people were these who would thus brave death for their belief, and ceased to scoff at the reality of conversions which could stand so terrible a test.

"The missionaries themselves were in a most precarious position, and at one time Mackay's death was even planned by the king. There were at this time eight Europeans in Uganda, for in June Junker arrived, and was allowed to proceed on his way. Two of the French Fathers accompanied him. In August, Mackay and Ashe determined to leave the country, but the king would only permit the latter to go, and



MWANGA, KABAKA (KING) OF UGANDA (page 24, vol. ii.).

retained Mackay. For a year this brave missionary was alone in Uganda, during which time a desultory persecution and massacre of Christians was continued. In July of the following year (1887) Mackay left, and went to the south of the lake. He was immediately succeeded by the Rev. E. C. Gordon, who was shortly afterwards joined by the Rev. R. H. Walker.

In the following year (1888), after another long spell of desultory persecution, the fiend in Mwanga again prompted him to a master-stroke of butchery. He assembled the whole of the Christian and Mohammedan converts on some pretence, and planned to take them across to an island in the lake, and there leave them to perish. The plot leaked out ; the would-be victims refused to obey the command, and marched on the capital. Mwanga fled, and was allowed to escape unhurt (Sept. 1888). He was deserted by all his following except the occupants of his own canoe—

some thirty persons. He took refuge on an island at the south of the lake. Meanwhile his brother Kiwewa was made king, and the Christians, being the more numerous, assumed most of the offices—the Mohammedans had the rest. The latter were jealous of the Christians, and, concealing their arms, suddenly took their rivals unawares, and treacherously murdered many of the chiefs. The Christians, panic-stricken, fled to the country, and took refuge in Ankoli (Oct. 1888). Again the lives of the Europeans—six in number—were in great danger; but, after a period of suspense, they were placed in a boat (which shortly afterwards capsized) on the lake, and were thus expelled the country and their goods looted."

The first contact with Mwanga is told page 21 :

"As a result of international negotiation, Uganda and the countries round about had been ceded to the influence of Great Britain. I, myself an officer of the army, had been deputed, as the representative of a great chartered company, to make a treaty with a semi-savage king noted for his cruelty and incapacity. I sought to unfair advantage, no acquisition of territory, no monopoly of trade, no annexation of revenues. My task was to save the country from itself; and for such a treaty as I proposed to make I saw no need to stoop to bargaining by presents (of arms, a Maxim gun, &c., as had at first been suggested), and no cause for obeisance or deference. It was for this reason, as well as to hasten my arrival before any crisis between the factions took place, or the expected munitions reached Uganda, that I crossed the Nile without waiting for permission, and, marching rapidly on the capital, selected my own camping-ground. Mackay and Ashe relate how they knelt before the king, when praying for permission to leave the country. Such an attitude seemed to me to lower the prestige of Europeans, and I determined to make my own methods the more marked by contrast.

"I had at my disposal on entering Uganda about 270 porters, some of them brave good fellows, but wholly undisciplined, and very excitable—difficult to control in action and liable to panic; others absolutely useless for fighting. Roughly speaking, perhaps one-third might be set down as good, one-third as indifferent, and one-third as useless. I had extremely little ammunition, that in the pouches of the men having quite perished in the long march* from the coast. My total reserve (some of which was always in very bad condition) consisted of only some eleven rounds per man, with four boxes of Maxim ammunition, and one of Winchester (with which rifles the Europeans, Shukri, and Dualla were armed). The Maxim was worn out, and I had no confidence in it—indeed it subsequently broke down radically when fired. I had also some fifty Sudanese and Somals, most of whom were brave and reliable men, and to some extent disciplined; but I could not speak their language, and relied on my factotum, Dualla, to interpret my orders to them. While Mr. Jackson had therefore the advantage over me in numbers, and in an adequate supply of ammunition, I had not had to face the same spirit of mutiny and insubordination with which he had to contend. There was a most excellent feeling throughout the caravan, and all were willing and loyal. Moreover, I had this incalculable advantage, that I brought in my pocket a copy of the Anglo-German agreement, by which Uganda was ceded to the exclusive influence of Great Britain.

"In pursuance of my intention to let the king see that I did not consider myself at his orders, I sent a message on arrival, thanking him for his welcome, and saying that as I was tired and had much work to do, I would defer seeing him till next day (Dec. 19th); nor did I hasten even then on arrival of his messengers, but went at my leisure."

"I took a dozen Sudanese with me, and their 'present arms' and bugle-flourish made my show in this respect nearly as good as the king's. He has quite a band of



BEATING THE ROYAL WAI-DRUMS (page 110, vol. ii.).

drums and other kinds of noise to herald the approach of a visitor, and these all struck up just as I drew up my little Sudanese guard, and 'presented.' They then remained close outside facing the *baraza* door. I found the king in the durbar-hut, surrounded by a mass of humanity, packed in every cubic inch of space in the (not very large) hut. I entered and sat on my chair on his right, taking care not to tread on his carpet—for I had luckily been warned, and could see that he was nervously anxious I should not do so. I shook hands cordially and frankly with him, for till now I had no idea he was the murderer of Hannington (I thought it was his father Mtesa). He is a young man, whose features are negroid, but show traces of Wahuma blood; his face betokens irresolution, a weak character, and a good deal of sensuality. I produced my three letters, two from Mr. Mackenzie and one from Sir F. de Winton. He said, 'Wait till the white men come.' I replied that I had brought letters for the king himself, and would read them without waiting. I did so, the letters being translated into simple English by me, into Swahili by Dualla, and into Kiganda by the interpreter (or at least some parts only, for Mwanga professes to know Swahili).



THE LATE MR. F. DE WINTON (page 37, vol. ii.).

I had just finished, when, to my surprise, the Revs. Walker and Gordon were ushered in. I had suggested all the Europeans being there, but the priests had declined, on the ground that they would take no further part in politics, and it was therefore agreed that Gordon and Walker should not come either. I suppose the king sent specially for them. They were asked again to translate the letters, which they did. . . ."

"I then said I had come merely to pay salaams, &c., and would talk of other matters by-and-by. There was very great relief and joy in the court at there being no mention in the letters or by me of a flag. It appears they are nervously afraid of a flag, understanding that it means that they give away their country, and the *Wa-Fransa* are prepared possibly to fight sooner than accept it. I am told they have especially noticed the contrast in this respect between others and myself. Peters, Jackson, the French and Germans, all have talked of nothing but a flag. But in my camp they see the colours of each batch of men flying over the 'camp' of the head-man—the Sudanese with theirs, the big camp flags marking out camp, and no Com-

pany's flag flying at all ! I had forgotten this last ; our line-of-march one is utterly worn out, and I am not sure where I put the new ones. This being so, and the country being already ceded to British influence by international agreement, I do not intend to make any childish fuss about the flag. If I can get a treaty, the flag will come of its own accord, and at their own request later on.

"The king gave an order in court to send me food for my men. It is the custom, I believe, for the king to dismiss the *baraza*, but I asked Gordon if I should transgress greatly by taking my own *congé*, and he said he thought not. So I rose, and said I had finished my words for to-day ; and with great cordiality and many *ahsantis* (thank you) and hand-shakings I left, and the king and court rose and left by the other door. This was a final assertion that I was my own master, and, of course, though I have taken this somewhat independent attitude, I have been at great pains to show that it does not arise from mere bravado, or a wish to wound the susceptibilities of the king. . . .

"I had many visitors in camp, all the big chiefs coming and making salaams. To all of them alike I showed all the courtesy and frankness I could, especially



ROYAL WAR DRUM OF UGANDA (page 569, vol. ii.).

acknowledging to the Roman Catholic chief that he was the very first to come, and thanking him for it. I told them all the same thing—that my errand was to bring peace not war, that I hoped to arrange disputes satisfactorily, and that to me *all* were exactly alike—Roman Catholics, Protestants, and every one. Mwanga's *baraza* was stifling. It was a curious assemblage ; there were uniforms of all kinds and classes, many naval (of different nationalities), and Peters' scarlet-and-gold dress, with gold-laced fez cap, was resplendent on the Head of the Army."

When the troubles had somewhat subsided, Captain Lugard journeyed on, and we extract a few words of description of the lake :—

AN AFRICAN MEDITERRANEAN.

"From the extreme point of the promontory of Buganga a lovely view of the lake was obtainable. Its waters—blue as the Mediterranean, indigo blue—spread out before you, its bays as still and silent as mill-ponds. The heavy black forests of

Bunjako lie on the left, while the great island of Sessé breaks the horizon to the right. In this kind of life of perpetual worry and anxiety with these people, the charm of such exquisite scenery acts like a sedative, and elevates one's feelings and thoughts above the worries of the moment. A shade of sadness seems somehow natural to an appreciation of the grandeur or beauty of nature, especially when that beauty is essentially peaceful, silent, and still, and has come upon one unexpectedly, with the sense that it has been there for all time. It is as though the soul recognised the resemblance to some autenatal paradise ; and, if we believe with Plato that this is



TYPE OF A NATIVE (page 594, vol. ii.).

indeed *ἀναμνησις*, small cause for wonder that the unknown contrast throws a tinge of melancholy over our appreciation. It is at such moments that we recall the un-forgotten past, robbed of its anxieties, its sorrows, and its doubts, like the memory of a dream. It is thus in the material world that distance, lending a softening touch to the rugged mountain, hides its rough paths and precipices, and shows only a soft and gentle outline.

"Leaving Buganga, I retraced my steps to Baja through the waist-deep swamps which bordered the lake, and thence directed my course to Luwambu. I shot one or

two hippo, leaving them for the natives (if they died and floated subsequently). On the 31st I shot, while on the march, three of the Uganda variety of the water-buck (*sing-sing*), and so supplied my men again with meat, and had some to give as presents to chiefs in return for food, for a water-buck must scale 300lb. at least. The island of Luwambu lies between the mainland and the great island of Sessé, almost in the very straits between the two. On each side, therefore, there is but a narrow channel left, and through this canoes must pass, unless they go round the coast of Sessé, a route so much exposed to storms and heavy seas that it is rarely adopted. In the sheltered water between Sessé and the mainland there would, I think, be a capital harbour for a steamer.



BLANTYRE CHURCH—EXTERIOR (page 474, vol. i.).

"The district of Bujaju, which borders the lake opposite to Luwambu, I thus describe: 'We passed through a charming country. All the 10ft.-high coarse bamboo grass ceased, and was replaced by a low soft English-like grass. The soil was black but sandy, and looked as though it would make the perfection of light loam. Everywhere are patches of bush and date-palm, which would afford abundant fuel; while after going some six and a half miles, the forest, which had been visible to the right and front, closed in with magnificent timber-trees, through which, however, still continued the large open blades of sweet grass. The soil became poorer towards

the lake, more sandy, and in places rocky. Another couple of miles brought us into a belt of primeval forest, the trees festooned with mosses and ferns, and the undergrowth dense. Beyond this narrow strip was the beach of the great lake, with white-crested breakers beating in on the shore.' "

We cannot enter into the quarrels of the religious bodies, which have had so disastrous a result for Uganda, but the chapters relating the events are of intense interest, and require very careful study.

We regretfully close these extracts (it would be needful to extract the whole volumes to give all that is interesting and valuable), with the two letters from Mwanga :—

"Letter from Mwanga to the Queen.

[Translation.]

"Uganda, Mengo, June 17, 1892.

"TO MY FRIEND THE QUEEN, OUR GREAT SOVEREIGN :

"I and my chiefs send you many greetings. I write this letter to thank you. Thank you exceedingly for sending the representatives of the Company in order to set my country to rights.

"When they reached Uganda, at first I did not like them ; I did not think that they could set the country to rights. After we had fought, Captain Lugard wrote me a letter, and invited me, and restored me to my kingdom ; then he went and invited the Mohammedans as well, with whom I had been at war, and brought them back, and gave them a part of the country. But now my country is at peace ; the agents of the Company have arranged it excellently. Now I earnestly beseech you to help me ; do not recall the Company from my country. I and my chiefs are under the English flag, as the people of India are under your flag ; we desire very, very much that the English should arrange this country ; should you recall these agents of the Company, my friend, my country is sure to be ruined, war is sure to come.

"Captain Lugard has now brought to terms these three religions ; he has returned to England ; he will inform you of the state of affairs in Uganda. But I want you to send this same Captain Lugard back again to Uganda, that he may finish his work of arranging the country, for he is a man of very great ability, and all the Waganda like him very much ; he is gentle ; his judgments are just and true, so I want you to send him back to Uganda. So, our friend, persevere in helping us, for we are your people.

"May God give you blessing and long life.

(Signed) I, MWANGA, King of Uganda, and my great chiefs."

[Names of chiefs added.]

Mwanga to Directors, I.B.E.A.C.

"TO MY FRIENDS THE DIRECTORS OF THE COMPANY IN ENGLAND :

"I and my chiefs send you many greetings. My friends, many, many thanks for sending so able a man as this Captain Lugard to arrange my country. My friends, at first when the agents of the Company arrived in Uganda, at first I did not like them. I thought they had come to ruin my country. But after we had fought, Captain Lugard wrote me a letter and invited me back, and restored me to my kingdom. Then Captain Lugard went and brought the Mohammedans as well, those with whom I had been at war, and brought them back into Uganda, and gave them a part of the country. Now Uganda has been settled and is at peace. Captain Lugard has returned to England, he will inform you of all affairs in Uganda. But, my friends, I

beseech you, do not cease from helping us. I want you to send a number of Europeans to Uganda to settle it. Do not be grieved by the thought that there are no profits in Uganda—'our outlay will be without returns.' It is not so. I tell you so, because of late what has been making ivory scarce in the country has been the late war. And now Captain Lugard has succeeded in bringing the three religions to terms; he has settled the country, and wealth will now increase in the country, and the Company will make profits. My friends, I and my chiefs agree to be under the Company's flag. We want the Company to help us to settle this country, and to occupy it in force. Should you at present recall your forces from Uganda, the country is ruined, there will be war again. Therefore, I pray you not to cease from helping us in Uganda, for we are your people. Further, we ask you, our friends, to bring us guns for sale, and useful articles. May God help you ever to wise decisions in respect to this our country Uganda. I am your friend, who loves you.

(Signed) MWANGA, King of Uganda, and my great chiefs."

[Names of the chiefs added in full.]

"*Note by Chiefs.*—But we, the Protestant chiefs, were annoyed with Captain Lugard. It is a small matter about which we wrote to the Elders of the Church [Church Missionary Society] to tell you, the Directors of the Company, to give us another man, who might perhaps please us. But a short time afterwards he, Captain Lugard, settled the matter which had annoyed us, and pleased both us and those of all religions in Uganda, as well as those who do not know how to read [religion]. Now he is the friend of all of us who are in Uganda."

The following pictures, reprinted by the kind permission of the publishers, give an idea of the wealth of illustration in these two volumes. The question of space has compelled us to select the smaller blocks, but the larger ones are of equal interest and value.

VOL. I.

- No. 1 * (page 51). Mandala House. Messrs. Moirs' House.
- No. 2 (page 53). Wankonde Village.
- No. 3 (page 68). Dr. D. Kerr Cross.
- No. 4 (page 77). Mlozi, the Leader of the Slavers.
- No. 5 (page 83). Dr. Laws.
- No. 6 (page 239). A Swahili.
- No. 7 (page 316). Nzoi Peak.
- No. 8 (page 474). Blantyre Church—exterior. An interior view is also given.

VOL. II.

- No. 9 (page 24). Mwanga, King of Uganda, son of Mtesa.
- No. 10 (page 37). The late Mr. F. de Winton.
- No. 11 (page 111). Beating the Royal War Drums by Mwanga.
- No. 12 (page 446). Mwanga's Guitar.
- No. 13 (page 509). The Royal Uganda War Drum.
- No. 14 (page 594). A Native Type.

* The pages referred to are the pages of the two volumes of Capt. Lugard.

THE ZAMBESI BASIN AND NYASSALAND. By DANIEL J. RANKIN, F.R.S.G.S., M.R.A.S. 288pp., ten illustrations, three maps, contents, and index. *Edinburgh: W. Blackwood and Sons, 1893.*

In sixteen chapters, Mr. Rankin gives an account of his adventures on the Zambesi, on the East African coast, discusses questions of native manners and customs, races, Portuguese government, the navigation of the river, and his discovery of the Chinde river.

The descriptions are very well done, and the narrative is racy.

Perhaps enough has not been made of Mr. Rankin's work in opening the Chinde, by which a free passage has been made possible for shipping.

This is most important for the future development of the Shiré and of the Nyasa lands, and even for British territory south of the Zambesi.

Advantage of the Chinde route has already been taken, and a transport company is now at work on the river.

Some of the descriptions of Mr. Rankin, we have said, are amusing. Perhaps the best way to illustrate them will be to quote his account of the saloon s.s. *Lady Nyassa*. The British Consul, his family, and Mr. Rankin are voyaging up the river, and are transferred to this Glasgow steamer :—

THE LADY NYASSA.

"The *Lady Nyassa*, which was to take us into the interior, was awaiting us half a mile away, and we could just see the top of her funnel over a mud-bank. She was a paddle steamboat, advertised in Glasgow as a saloon steamer. She belonged originally to the Scottish Mission, for whom she was subscribed by Sunday-school children. She was eventually relegated to the African Lakes Company, to enable them to carry out more effectually their well-known philanthropic and missionary enterprise. We had heard so much of this craft at home that, although we had comparative comfort on board the tug, we were naturally all anxious to change our present quarters for the superior accommodation of the *Lady Nyassa*.

"Our baggage and gear were sent on in boats, and in a couple of days all our chattels had been transferred to her, so that we bade good-bye to the captain of the tug, and rowed over with Mrs. Foot, the nurse, and children, to be in time for dinner on board our new home.

"We did not see the *Lady Nyassa* until we had rounded the mud-bank, when she was discovered. We were not greatly impressed by the first sight of the vessel, though doubtless this was owing to our having been accustomed for so long to the ocean-liners. Running our boat alongside, we boarded her. In the stern was a ragged, discoloured piece of canvas stretched over what appeared to be a box with the lid off fixed in the deck. Two-thirds of the boat in the centre were taken up by an engine and boiler, on which were four negroes scraping off the top layer of rust. The rest of the boat was a triangle in the bows about 6ft. by 8ft. On this triangle was a deck; on the deck were two goats and two kids browsing on the grass that grew in the seams, and a hen-coop full of fowls gave the place quite a homely and rural aspect. Mr. Gouk, a carpenter by trade, who fulfilled the offices of captain, engineer, purser, &c., on the steamer, we found on the smoke-box with a plate of rice and a boiled fowl on his knees, evidently dining.

"Mrs. Foot, the nurse, and children being tired, were anxious to go down into the saloon. After we had wandered wearily several times round the piece of canvas in the stern, a messenger was despatched to inquire of the captain its exact locality—

the ladies meanwhile resting on an empty hen-coop which was fortunately handy. The captain having now finished his dinner, was at liberty to attend to the requirements of his passengers. He expressed great astonishment at their perplexity, and in a very short time acquainted us with the startling economy and admirable compactness of the Zambesi liner. One or two blankets at the bottom of the box in the stern made up most excellent sleeping accommodation for the ladies; one half of this space, however, we were informed, was set apart for baling purposes to keep the steamer afloat. At the entrance several feet of boarding were taken away, and the iron bottom exposed, which looked considerably worm-eaten. In this stood a negro baling with a tin pannikin. To ensure greater privacy a shawl came in useful to make a partition, so that in a very short time we were enabled to leave the ladies to recuperate themselves after the fatigue of the day, and prepare their toilet for dinner.

"We were then informed by the captain that the dining-saloon and the male passengers' sleeping accommodation were forward. The saloon we reached after a perilous journey over the smoke-box, and had no difficulty in fixing upon the farm-yard as the precise site.

"We rested on the boiler while a negro swept up the saloon. The goats and the kids were relegated to the stoke-hole, six inches below us; the hen-coop was tied up at the point of the triangle in the bows, the same distance in front of us. Around the sides were several logs used as fuel for the steamer; these, we found, made excellent *fauteuils*, after having dusted off the more intrusive scorpions and other vermin of an equally noxious nature. We sat on these logs for some minutes in a state of profound meditation, till at last Winton expressed an opinion that it was time the bell rang for dinner. We then ventured to ask the captain, who was superintending the scraping on the boiler, what there was to eat, and were told two cuckoos were roasting in the furnace. We had not tasted cuckoos before, but anything appeared appetising at that moment.

"Captain Foot went aft, and a few minutes afterwards returned leading his lady and the nurse, the children being left fast asleep. We arranged ourselves around the sides of the triangle, waiting for the appearance of the cuckoos. By this time the sun had gone down. The sky overhead was brilliant with stars. Hippos splashed alongside, thundering their gruff cachinnations. Half an hour of twilight and we were covered in pitchy darkness. The air was filled with the noise of myriads of insects buzzing and whirring in the neighbouring swamp. The gaunt stems of the mangroves were lit up by swarms of fireflies, whose great brilliancy made them appear like stars of the first magnitude. I caught one, and by holding it between my finger and thumb could easily tell the time by its light, or read a letter by passing it along the lines. Two candles were brought by a negro. He melted their ends, and stuck them on the deck between us. The air was perfectly still. Tin plates were put round at our feet, one opposite each person. A distinct aroma of cooking told us that our cuckoos were nearly ready. No sooner, however, had the candles been placed on the deck than we were besieged by innumerable armies of creeping things—flying cockroaches, ants, bugs, moths, earwigs, mosquitoes, and several other varieties of the same family. Each candle soon became a crematorium, with a heap of scorched bodies piled up around it. Our plates were filled with vermin. We sat in agonised misery, which no amount of scratching or rubbing could alleviate. They crawled down our necks, and up our legs and arms, until the more sensitive of us felt like jumping overboard. The cuckoos came on, and we were relieved to find that they had been transformed into the homely fowl."*

* The natives, we found afterwards, called a fowl a cuckoo, spelt *kuku*.

The description of Chiromo and of Bishop Mackenzie's grave will interest some of the members :—

CHIROMO.

"Another day's steam brought us to Chiromo, a large native town then under the rule of Chipitula, one of Dr. Livingstone's *protégés*. This town was built on the north bank of the Ruo, on the narrow neck of land at its confluence with the Shiré. Since our first visit it has passed through many and eventful phases of history. The medley of native huts we then saw have been swept away, and removed some distance up the Ruo.

"In 1888 this place was the scene of the historical battle of Chiromo, which ended in the retirement of the Portuguese troops under Major Serpa Pinto, and the declaration of the British Protectorate of the Shiré highlands, an event that marked the official birth of this newest offspring of our great colonial empire.

"On a small island to the south of the confluence is the site of Bishop Mackenzie's grave, the pioneer of the Universities' Mission to this part of Africa in 1859. Wishing to visit it, in conformity with the pious custom of travellers at that time, who made it their duty to clear it from the encroachments of the bush, we obtained the services of a guide, and passed over the Ruo in a large canoe. Our guide was here evidently at a loss, and we searched for some time amongst the undergrowth for the Bishop's grave. Under the overhanging branches of one of the trees we came across a native tomb. We crept under the thick foliage, and stood shut out from the glare of the sun in a large arboreal chamber, whose roof and walls were formed of impenetrable masses of branches and leaves. The sudden change from the bright light outside to the intense gloom within required some seconds for our eyes to be able to discern the sepulchral surroundings. At the base of the trunk, in the centre of this house of the dead, were heaps of stones marking graves. At the head of each was a round earthen pot, at one time filled with food, long ago carried off by the ants. Above our heads, suspended in strings of matting to the branches, were dozens of bodies, tier above tier, until they were lost high up in the gloom. These, we were told, were the remains of those who had died by evil influences, such as measles, whooping cough, and other strange and unaccountable diseases. Around these hammocks great bloated spiders had woven a shroud of webs, and were evidently, from their robust condition, on the most intimate terms with the dead inmates. A sickly and oppressive odour exuded from the decaying bodies, and was too overpowering for us to remain for more than a few minutes in this charnel-house. We now almost despaired of seeing Bishop Mackenzie's grave, as it was getting time for us to get back; but, retracing our steps, we found the little iron cross which marked its site. It had fallen down in the grass, and a fair-sized tree, growing out of the grave, showed that it had not been visited for some time past. We cleared away all the undergrowth, and returned to the steamer."

Mr. Rankin is very severe on the half-caste natives, "Muzungus," who have been appointed to small chieftainships, and if the story of Bonga is to be taken as a fair sample of the daily life under such heads, it is quite time Portugal stepped in and made an alteration. At the close of the book it is rather suggested that this is being done, and it is quite time for it.

BONGA THE MUZUNGU AND HIS CHILDREN.

"Bonga, another of these Muzungus, had in a certain degree a facetious disposition. His chief town was on the banks of the Zambesi river, near the Lupata, called Sungo. Promenading with his court on the sands of the river, instigated by *cannui*

and a brutish ferocity inherent in this class of people, he would watch the numberless heads of crocodiles floating idly in the stream. Calling to one of his *cortège* who stood trembling behind, he would say to him, 'My friend, see my children; do they not look hungry?' The attendant, his teeth chattering with fear, his limbs shaking, and his eyes starting from his head, would answer, 'My lord, they are hungry.' Then Bonga would turn with a grim smile on his face and say quietly, 'My friend, why should they be hungry when there is food? Give them of our abundance; go, friend, and feed them; my children must not starve.' Darting his eyes around like a terrified animal, the unfortunate sees no compassionate face on any side. Fear has paralysed his brain. He answers, 'My lord, I go to feed them.' Like one in a dream he staggers down to the water's edge into the river. The brutes rush upon him. There is a piercing shriek, the ruffled waters are tinged with red, and Bonga's children are fed. Bonga, a cold placid smile on his face, walks back to the town, hardly amused with the incident. Often on these occasions he is not satisfied with a man, but despatches one of his dependants to bring his young spouse, whose ghastly fate and the agony of her lover afford him a few minutes' entertainment."

A few words descriptive of the Muzungus bring them out in bold relief :—

UNDI AND MAKANGA.

"The inhabitants of Undi and Makanga territories show few signs of inter-marriage with any of the neighbouring tribes, though the prevalence of Portuguese admixture is very noticeable in the Makanga district.

"The first class, resulting from intermixture with Portuguese, is mostly seen in a few of the women employed in the chief's harem, who have been captured from the Portuguese settlements on the river.

"The offspring constitute a well-defined class, who are styled Muzungus. They occupy a social status generally superior to that of the pure natives.

"The characteristics of the men evince a much lower moral type. They are conspicuous for callousness and a predilection for the grossest forms of brutality, dishonesty, and sensuousness. Subsequent children evince appreciable improvement as they become emerged into the national type."

But the chief interest of the book is the Chinde, and it is well to let Mr. Rankin tell the story of the discovery in his own way :—

THE CHINDE.

"Compared with the other outlets of the Zambesi, the Chinde presents peculiar characteristics. The formation of its confluence with the main stream is of such a nature that the vast volume of suspended alluvial matter brought down from the interior is swept past, and even in the greatest floods only an insignificant portion finds its way into this channel. As a result of its extremely tortuous course, and the fact that its whole length is subject to tidal influence, whatever fluvial *débris* finds its way into the Chinde is invariably precipitated before the bar is reached, much of it, indeed, being carried back into the main stream. This is naturally of primary importance in estimating the probabilities of the permanency of this outlet for navigation. On the Chinde bar there is scarcely a trace of alluvial deposit, and it possesses all the characteristics of an estuary of the sea. During the dry season, the ebb-currents reaching their minimum of force, the flood-tides gradually silt up the entrance with sand; but as the rains increase the volume and power of the ebb-tides, this sand is rapidly scoured out, and the channel materially deepened.

"At the other mouths of the Zambesi, however, we find the bars covered with alluvial deposit precipitated for some distance out to sea, so that not only are they

subject to silt from the seaward, but are constantly augmented by the deposition of fluvial *débris*. It is therefore obviously erroneous to predicate the variableness of the Chinde outlet on deductions based on the remaining outlets, for the conditions pertaining to the Chinde bar are essentially different from those obtaining in the other mouths of the Zambesi river.

"Seeing, then, how the channel of this bar is slightly silted up during the dry season, and the accumulated deposit swept away periodically during the rains, it will be at once evident that if treated in the manner that has proved so successful under similar conditions in the case of the Mississippi, the depth of the channel would become permanently increased by the silt being carried back into the sea with the ebb tides.

"From these and other minor indications I became convinced that in the highest probability a deep navigable channel would be found over its bar, and once I had ascertained this by practical experiment, my labours would be successfully terminated. This opinion, expressed to the few residents, met with unqualified incredulity from everyone except my host, Senhor d'Andrade. This gentleman was at the time engaged in building a number of lighters for river traffic, and he offered me the use of one to test the accuracy of my theory of the navigability of the Chinde entrance. He hoped the lighter would be completed in the middle of the following January. No other suitable craft being available, I was only too gratified at my good fortune in obtaining this generous offer.

"For five months I continued my wanderings amid the islands and streams of this great alluvial region. I camped among the oil-seed plantations that here and there covered the country for many square miles, or amid groves of cocoa-palms, under which the natives were busy preparing copra for export, or in the midst of forest and jungle, whose luxuriant vegetation gave evidence of the wealth of the virgin soil beneath.

"Though this region can naturally not lay claim to the salubrity of the interior highlands, nevertheless it is noteworthy that the few English and other Europeans who have made their homes there have enjoyed a remarkable immunity from serious ailments, consequent on the peculiar conditions of their environment. There are few who have not experienced excellent health after a continued residency of from five to twenty years or more; and I myself, though exposed to all the inclemencies of a rainy season in tents, suffered no ill results from climatic and other local causes.

"In January, 1889, I returned to my friend, Senhor d'Andrade, and found to my satisfaction that the long-awaited craft was already in the water. We started without further delay down stream for the mouth, with, on my part, considerable trepidation as to the result of my weary and protracted travels. At night we anchored near the beach of Mitaone Island. Anxiously gazing seawards in the direction of the bar, we could discern nothing but an apparently unbroken line of breakers, whose ceaseless roar can scarcely be rendered in words.

"A few days later we drifted out in our unwieldy craft towards the breakers. The native crew, novices to the use of the cumbersome oars, were powerless to affect the direction of the lighter. A strong wind was blowing off shore, and the tide rushed out with headlong velocity. Swept helplessly towards the breakers, I had scarcely time to throw over our anchor and run out the flying chain before we were brought up with a sudden jerk that sorely tested the native-manufactured iron close under, the combing surf dashing over our stern. The tide rushed past us, and to drift a yard meant certain death; but the anchor held staunchly, and we waited with the greatest anxiety for the incoming tide to drift us back shorewards from our perilous predicament. I made several unsuccessful attempts to cross the bar, accom-

panied by two Portuguese gentlemen, though I was still sanguine of my ultimate success.

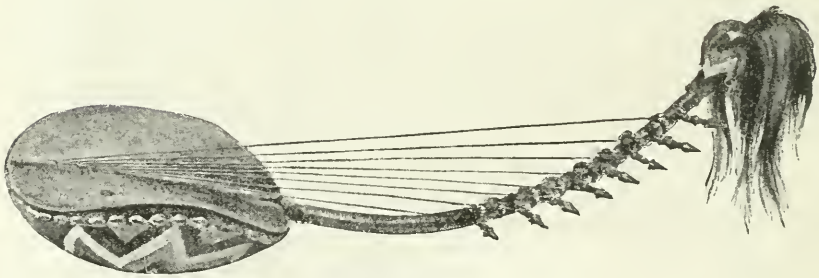
"Two weeks passed, and I determined to make another venture, though neither of my friends thought it expedient to again accompany me, considering their previous unfortunate experience. On my last essay fortune proved more propitious, and I had the great satisfaction of passing over the bar, through the channel, and out to sea—an adventure naturally not without considerable peril, from the nature of my craft.

"Having completed my arduous task satisfactorily, and equal to my most sanguine expectations, I returned with the greatest possible expedition to Quillimane, where I arrived on February 26, 1889, after a series of adventures of more or less disagreeable nature.

"The object of my extended journey was accomplished, and I had shown that the door of Central Africa was opened, and sealed no longer. A few months later a British man-of-war cleaved the great Zambesi, and the Union Jack waved over its waters."

The book is of interest and of value. It will well repay perusal to the hunter, the naturalist, the statesman, and the philanthropist.

There is a humorous side to the story, as there is to most things; but the prevailing tone is sad and sombre, and shows the trail of the curse of the slave trade through the length and breadth of the land.



MWANGA'S GUITAR.

(Page 446, vol. ii., Capt. Lugard's Book. See pp. 159 &c.)

PROCEEDINGS OF THE SOCIETY.

JULY 1st TO DECEMBER 31st, 1893.

The 256th Meeting of the Society, held at the "Hut," Finchwood, Marple
Saturday, July 1st, 1893, at 6 p.m.



VIEW OF MARPLE.

Mr. Joel Wainwright, J.P., guided a large number of members from Marple Station through a beautiful series of woodland paths and out on to the high level road, eventually arriving at Finchwood, where he dispensed his generous hospitality. Considerable information as to the landmarks of the district, its geological formation, flora and fauna, was given, and a most delightful afternoon was spent under Mr. Wainwright's guidance.

Very hearty thanks were tendered to Mr. Wainwright and his family, and to all who had contributed to the comfort and enjoyment of the party.

A letter was read from Mr. Gustav Reiss, announcing the sad death of Mr. J. M. Haarbleicher, from an accident in the Lake District, and an announcement of the death of Councillor Fletcher was read. Votes of condolence were passed, and the secretary was requested to convey the same to the families of each of the late members.

The 257th Meeting of the Society, held at Whitworth Park, Wednesday, July 5th, 1893, at 4 o'clock p.m.

By permission of the Whitworth Trustees the members were permitted to view at their leisure the fine collection of English water-colours on exhibition in Grove House, Mr. J. D. Wilde kindly undertaking the leadership.

The members were afterwards received by Mr. C. H. Lees, of Owens College, and the Meteorological instruments in the park were inspected. The object of the observatory and the methods of work were explained with great lucidity, some results of the records being given.

Thanks were passed to the trustees, to Mr. Wilde, and to the meteorologists for their kindness.

The 258th Meeting of the Society, held at the "Childe of Hale" Hotel, Wednesday, July 3rd, 1893, at 6 p.m.

SPEKE HALL.

Miss Watt having very kindly given permission for the Society to visit this beautiful magpie hall, a party of members availed themselves of this exceptional opportunity, and a thorough inspection of the hall was made.

Speke Hall is Elizabethan in character, and might be a miniature of Bramhall. It was originally surrounded with a moat, and had a drawbridge, but this has been taken away, and a handsome stone bridge built across the moat from the door to the lawn in front. An inscription over the door reads:—

"THIS WORKE 25 YARDS LONG, WAS WHOLLY BVILT BY EDW: N: ESQ: ANO 1598."

The hall is mentioned in Domesday Book, and was the seat of a Saxon thane. Roger de Poitou at one time owned it, but lost it by forfeiture in 1250. Norreys, who fought at Flodden Field under Lord Stanley in 1513, began the present building, using in the dining-room a good deal of carved oak, which he brought with him from Holyrood. Edward Norreys completed the hall in 1598. The wood carving and general ornamentation are very rich. There is a fine collection of old armour, carved sideboards, heavy oak furniture and also of pictures. The building has a spacious quadrangle, with corridors running on every side. There is a ghost chamber, but the lady looking for her baby, which had been thrown into the moat, has not been seen lately. In the quadrangle are two fine yew trees, said to have been in their present position when the hall was built. One is a male and the other a female tree, and the latter still bears red yew berries. There is a very fine avenue leading from the lawn to the river. In 1736 Speke passed from the Beauclerk family, into which it had gone by marriage, and was bought by Mr. Richard Watt, a West India merchant, of Liverpool, and is now held by his descendant, Miss Ada Watt.

The members were very much delighted with the visit and, after being very kindly entertained, they drove through the village of Hale to Hale Hall.

HALE HALL.

Mrs. Ireland Blackburne received the members, and they were very courteously shown through the building. The old hall at Hale, now called "The Hutt," had a great hall 130 feet long. It has gone to decay, and part of the fittings and woodwork were used in the building of the new hall by Colonel Blackburne, about 1674.

The Hall has a fine library, and contains the records of the old chartered town of Hale, which was an important place when Liverpool was a fishing village. There is a rare collection of British and foreign birds, made by Miss Blackburne, about the end of the last century. There are also collections of medals, and of butterflies and moths. Pictures by Romney and other painters beautify the walls. The garden contains many interesting plants, including two out of three vines said to have been two hundred years old when they were transplanted from Orrel Mount, whilst the park, sloping down to the Mersey, has grand Linden trees, the home of bees. A thunder-storm prevented the members from enjoying the gardens, and another visit was suggested for this purpose.

After tea at the "Childe of Hale," a visit was made to the village, with its numerous gardens, and to the church, where the grave of the "childe," over nine feet long, was inspected. His walking-stick had been seen at the hall.

Very hearty thanks were passed to all who had assisted to make this day a memorable one, and the members drove back to the station, arriving in Manchester in good time.

The 259th Meeting of the Society, held at Mr. Arthur Greg's, Eagley, near Bolton, Saturday, July 22nd, 1893, at 6 p.m.

(See Illustrations, page 1.)

A large party of members took train for Bolton Station, where they were met by Mr. E. W. Greg, and drove to Turton, Dunscar, Smithills, and back to Eagley.

The weather was exceptionally fine, and, having been previously cleared by heavy rain, the atmosphere was translucent, the valleys with the distant hills standing out with unusual clearness. On the right a splendid panorama of hills was seen, ranging from the flanks of Rivington, taking in Belmont, and across the valley, looking past Holcombe, the Grant Monument and Summerseat were very distinct. The fields, houses, villages, roads, the line of railway, and the purple slopes to the moor tops were sharply brought out, and a very good idea of the local geography of this part of Lancashire was obtained. The westering sun flooded the valleys with its warm and golden glow, and, instead of appearing dark, gloomy, and smoky, as it is often seen, the country was transfigured.

After leaving Bolton Station a glimpse was obtained of Hall-i'-th'-Wood, the old home of Crompton, intimately connected with the history of the cotton trade. The "fiddling weaver," who worked out his theories in that old magpie dwelling to practical issues, and who left his machine to the trade, was but poorly rewarded. Bolton may well have placed a statue of this public benefactor in one of its public places. There is a handsome reduced copy of the Leeds Town Hall at Bolton; but the old magpie house (Hall-i'-th'-Wood) erected in 1483, the grey stone part in 1648, a house often selected by architects as a model, is one of the most precious records of the past possessed by the Bolton of the Moors.

The great Chadwick Thread Works were next seen and admired. Bolton has fine spinning, and a story was told in regard to that quality. A piece of cloth (muslin) was returned to the manufacturer as not being equal to the requirements. The piece

was shown to the weavers and overlookers to see if they could find the fault; but they could see none, and it was necessary to use the whaling glass before the fault could be found, consisting of some thicker threads running through the fabric, and as the cloth was intended to be sent to Paris, to make artificial flowers, these thick threads would spoil the effect of the delicate dyes used, and the cloth was therefore disqualified.

At Turton Tower the party was most kindly received by Mr. and Mrs. W. R. Rigg, and the whole house was thrown open for inspection. The history of those who have held the Tower is the history of Lancashire. The Orrels, the Chethams, the Kays have had it in possession, not the least of them being Humphrey Chetham, and this circumstance connects this moorland home, by the generous gift of its sometime occupier, with the College at Manchester.

In the hands of Mr. Rigg the Tower is kept with care, and is a veritable treasure-house of antiquities.

There is some fine wood-carving in the dining-room, a staircase of similar design to the one leading to the master's room at Chetham College, beautiful Dutch (?) tapestries restored with great skill, and in one room a map of Europe dated 1798, the ground, satin, the rivers, mountain ranges, borders of states, and the names of towns and countries worked in various colours of silk. There were also splendid specimens of old carved furniture, a collection of old arms hang on the walls, and some old painted glass in the windows. The solid oak doors were also admired. A splendid prospect was obtained from the Tower, and a few photographs were taken.

The members thanked Mr. and Mrs. Rigg for their kind reception of them, and expressed their delight in viewing the historic pile.

Mr. Rigg responded, and said it had given them much pleasure to receive the Society, and they would be glad to see the members again at another time.

Some of the party then joined Mr. E. W. Greg in exploring the beautiful valleys, and they rejoined the main body, who had driven by Eagley to Smithills, at that old Lancashire hall.

Mr. R. H. Ainsworth here received the members, where, perhaps, the finest hall of its kind was thrown open and inspected. The chapel was visited, and the stone was pointed out which, according to tradition, was marked by Marsh the martyr where he stamped his foot. The chapel stands on the site of one built in 793 (a hundred years before King Alfred), which was dedicated to the Blessed Virgin. The gardens and lawns were very beautiful, and the opinion was expressed that this house must, in early days, have been a place of great natural strength. The statement that the hall stood on the site of an old Saxon homestead and stronghold, succeeded by a Norman fort, which in more peaceful times gave way to this rich piece of fine domestic architecture of the sixteenth century, did not cause any surprise.

History, architecture, fable, song, and folk-lore seemed crowded into a handful, as the members realised the long centuries that have passed since the first Christian settlement was made on this spot.

This hall was the centre of a great Lollard and Nonconformist uprising, and the two martyrs—Bradford, burnt at Smithfield, July 1st, 1555, and Marsh, taken here and burnt at Chester, April 24th, 1555—represent a large number of nameless persecuted folk. The "Holy Well" was found to be used as a reservoir to a bleaching ground. The hall still stands a thing of beauty, with unsullied greensward, though within a mile of Bolton town.

Mr. Ainsworth took a good deal of trouble to explain the points of interest, and the party expressed very hearty thanks for the courtesy shown, and then drove to the house of Mr. Arthur Greg, at Eagley.

Mr. Greg received the members with great generosity and kindness, and regret was expressed at the unavoidable absence of Mrs. Greg. After tea Mr. J. C. Chorlton took the chair, and Alderman BOSDIN LEECH moved a very cordial vote of thanks to Mr. and Mrs. Greg for their hospitality, and to Mr. E. W. Greg for his valuable services as guide. Alderman BOWES seconded the motion, which was carried with unanimity. Mr. GREG responded, complimenting his fellow-members on the work being done by the Society.

Bolton Station was reached in good time, but owing to the terrible pressure it was late before the last of the members reached home.

The 260th Meeting of the Society, held at Monk's Heath Hotel, Saturday, August 5th, 1893.

The members drove from Chelford Station to the fine Park and Hall, at Capes-thorne, of Mr. Bromley Davenport, M.P., who had very kindly given permission for the visit. The beautiful gardens and the park, containing a large number of English forest trees in fruit, and innumerable rabbits, were shown by the gardener, and the housekeeper exhibited the works of art—pictures, statuary, carving, and tapestry; and a very enjoyable afternoon was spent.

Mr. Philip Whyman and Mrs. Whyman entertained the members at Monk's Heath Hotel. Descriptions of the district were given, its peculiar formation, the legends and the local witch stories were reported, and the rare plants and birds of the neighbourhood were referred to.

After tea, the Rev. S. A. STEINTAL took the chair, and thanks were heartily passed to Mr. Bromley Davenport and Mr. and Mrs. Whyman for their kindness. Some of the members had a pleasant walk to Alderley Station, the remainder returning from Chelford.

The 261st Meeting of the Society, held at Hale, Wednesday, August 9th.

A small party revisited the Hall to inspect the park and gardens, and were very kindly received by Mr. Ireland Blackburn.

The weather was very favourable for this purpose, and a few photographs were taken. Tea was obtained at the "Childe of Hale."

The 262nd Meeting of the Society, held at the Queen's Hotel, Hawkhurst, Kent, Saturday, August 19th, 1893.

A very small party undertook this delightful pilgrimage, visiting Canterbury, Hastings, Rye, Pevensey, Battle Abbey, Penshurst, Bayham Abbey, and other places. An account of the journey was promised by Mr. J. C. Blake for a meeting during the session.

It is surprising that so few members availed themselves of the opportunity of visiting this richly historical and naturally most beautiful part of our land.

A HOLIDAY IN KENT AND SUSSEX, AUGUST, 1893.

By Mr. J. C. BLAKE, F.R.G.S., F.I.Inst.

The following incomplete account of a very pleasant fortnight's tour through parts of Kent and Sussex is based upon an itinerary kindly drawn out by Mr. Wilde, one of our members, who undertook to act as leader to the party originally intended

to visit these parts last spring—and afterwards postponed until August—when, unfortunately, it had to be finally abandoned, in consequence of the very limited number—myself and wife—who were able to avail ourselves of so favourable an opportunity of visiting this extremely interesting and beautiful part of the country. Our tour extended over a few days longer than they originally projected, but in the main the same or very similar lines were adopted, and the pleasure and enjoyment were enhanced in no small degree by the kindness and unremitting attention of our secretary, who, notwithstanding our limited numbers, kept us constantly posted up as members of the Manchester Geographical Society, and amply supplied with orders to view the various places of interest, many of which were successfully presented on days other than those upon which the public were admitted, and upon all occasions, as members of the Society, we were received with the greatest courtesy, thus indicating that, after all, even in this respect, apart from many others, membership has its privileges.

We much regretted being deprived of the company of those who originally intended, but were afterwards prevented, joining the party, as I am quite sure that had they done so, like ourselves, they would have brought back very pleasing recollections of one of the most lovely parts of England, visited during an exceptionally fine summer, in which were seen to perfection acres of fruit trees and graceful hop vines, many of the former completely weighed down with beautiful ruddy-complexioned apples, also plums and pears in extraordinary abundance, almost at every turn of the roads through which we drove, whilst from an archaeological point of view the whole of the district, with its historical associations, is full of the deepest interest.

Leaving Manchester on Saturday, August 12th, we find ourselves the same evening at Canterbury. We were soon made aware of the antiquity of this interesting city, as, on our arrival, on reaching the Falstaff Hotel, just outside the old Westgate, we found a hostelry decidedly dating back to the olden times, a small but snug house, very suggestive of coaching days, with deep upper windows on the first floor, extending almost the full width of each room, glazed with the usual diminutive panes, and projecting some distance over the footpath, the upper storey terminating in the usual gable, whilst over the window of the room we were conducted to on the first floor was suspended, with very elaborate wrought-iron stanchions, a large painted sign of Shakespeare's chivalrous knight fully armed with sword and shield.

The next morning we attended service at the Cathedral, and the following day made an inspection of this venerable and imposing edifice under the directorship of the intelligent guide, who by the way presented a striking contrast to the usual parrot-like vergers frequently met with at most of our cathedrals.

After seeing many continental cathedrals, one may well be proud of those in our own country, not the least imposing amongst which is Christ Church Cathedral, Canterbury, embracing every variety of style of English ecclesiastical architecture from the rudest Saxon to the most finished of Gothic art. The scene of the murder of Thomas à Becket, in 1170, is pointed out as having taken place in the north-cross aisle, in a transept between the nave and choir, a small piece of stone, about four inches square, being let into the flag to replace the piece said to have been sent to Rome, containing marks of the blood of the murdered Chancellor. Time will not permit a more detailed description of this ancient building with its numerous chapels and tombs, the history of which is so closely associated with that of our own country, a proof of which may be gathered from the fact that out of ninety Archbishops no less than eighteen have been canonised, nine have been appointed Cardinals, twelve appointed Lord Chancellors of England, four Lord Treasurers, one Lord Chief Justice, and nine to the office of Chancellor of the University of Oxford.

The grounds adjoining the Cathedral were extremely interesting. Passing through the well-known "Dark Entry" on the north side into the Green Court, the King's School is seen, also the remains of the usual conventual buildings which, contrary to custom, are on this side of the Cathedral, and now converted into homes for Dean and Canons.

We next visit St. Augustine's Missionary College, erected on part of the site of the ancient abbey, the remains of which were sold by public auction in 1844, the purchaser being Mr. A. J. Beresford Hope, and mainly to his liberality and benevolence is the Church of England indebted for the restoration of the great gateway and the other buildings within its walls, wherein are accommodated about forty-two students and twelve native scholars trained to missionary work of the Church. Other contributions towards the buildings and endowments were also subscribed by members of the Church, and in 1848 the College was incorporated by royal charter. Beneath the library is a fine crypt, used as a workshop, wherein the students are taught carpentering, carving, and other branches of manual labour. Whatever may be our individual religious opinions it must, I think, be a source of considerable satisfaction to most of us that, after the lapse of centuries, this once imposing and extensive religious establishment should again ultimately emerge from gradual but certain decay, and become the means through which the blessings of Christianity have been bestowed upon so many dark places of the earth through the instrumentality of those who have gone forth from St. Augustine's College since its restoration.

To the east of the city, a short walk brings us to the Church of St. Martin, a small ivy-clad building favourably situated on a gentle eminence and said to be the oldest in England. This extremely venerable and unpretentious edifice is undoubtedly of Saxon origin and dates from the sixth century. Here may be seen the font in which Ethelbert is said to have been baptized by St. Augustine, who was specially sent by Pope Gregory for his conversion in 596, landing in the Isle of Thanet, having previously selected about forty of the most learned of his monks to accompany him for that purpose; but previously to this, the little Church was used for worship by Bertha, of France, Ethelbert's queen, who had already embraced Christianity, and through whose influence Ethelbert's conversion was brought about.

The tomb of Bertha may still be seen in the shape of a large rude stone coffin or sarcophagus at the north side of the little chancel. The interior of the church is well cared for, and the exterior walls in many places contain Roman bricks distinctly traceable amongst the mortar.

We were much interested in the numerous quaint old houses and shops in many of the streets, including some of those between which the river Stair runs, the windows in many cases on each side looking across to each other over the narrow stream, flowing gently along and washing the foundations of the houses in its course; in fact, a small Venice in its way.

With much regret we left Canterbury and spent Tuesday morning at Rye, an ancient borough formerly boasting of walls and gates, all of which, with the exception of the old Landgate, are now in ruins. This gate, said to be the finest of its kind in England, is an imposing structure and well worth seeing, as also is the Ypres tower dating from the reign of Stephen; no doubt in less favoured days than the present, it has come in for many hard knocks from the French and other enemies. The fine old Church at Rye is well worth a visit; it contains a clock whose pendulum may be seen in the nave moving its long gilded form of twenty-one feet to and fro through the ceiling. This clock which dates from 1515, contains chimes said to have been the gift of Queen Elizabeth, as also was the handsome carved mahogany Communion table. Ascending the tower a very fine view may be had of the surrounding scenery,

both seawards across the marsh, which extends many miles east and west, and also inland. We could distinctly see the cliffs of Dover in the distance, Dungeness, Camber Castle, and the numerous Martello Towers which extend for several miles along the coast at intervals in an easterly direction as far as Eastbourne. A good view of the harbour and shipping is also had from this position, the former being now about two miles from the tower, the sea having receded very considerably; the same remark applying also to Winchelsea, which we reached on leaving Rye the same day.

Winchelsea is another instance of an old town whose glory has departed. It is very pleasantly situated on an eminence commanding an excellent view of the surrounding coast, but some distance from the sea and now without any commercial significance whatever as a port. It must, however, in former days, have been a place of considerable importance having been surrounded by a wall, three of the gates at a considerable distance from each other being still in a good state of preservation. The most prominent object in Winchelsea is what remains of the once fine old Church of St. Thomas, now an ivy-clad ruin with the exception of the chancel which is still in use for worship. From underneath a tree still in existence in this churchyard, John Wesley preached his last sermon, October 7th, 1790.

At Winchelsea we visited the Abbey ruins situated in the very pretty grounds of Major Stileman at the Friars, being courteously received and conducted by the Major himself, although our visit was not paid on the day ordinarily set apart for visitors.

We left Winchelsea for Hastings, where we spent several days, including St. Leonards and Eastbourne.

A pleasant morning was spent by driving round Eastbourne and then on to Pevensey by train. Here William the Conqueror landed. The ruins of the old castle, dating from Saxon times, are extremely interesting and of considerable extent, the greater part of which is still in a good state of preservation and luxuriantly covered with ivy, the south front being approached by a low battlemented wall terminating in the usual drawbridge and portcullis. The effect of the beautiful red brick with which the castle is constructed, on first approaching it, is very striking, particularly when contrasted with the rich foliage of the surrounding trees, a row of fine old Spanish chesnuts on the western side of the moat being strikingly conspicuous. Bishop Littleton, in his essay on "The Antiquity of Brick Buildings in England since the time of the Romans," in the first volume of the "*Archæologia*" (p. 147, A.D. 1757) states that he can find no evidence of brick being employed in building from the reign of Richard II., A.D. 1377-1399, when De la Pole's house was built with brick at Kingston-on-Hull, till the erection of Herstmonceux Castle in 1440; and mentions it as worthy of remark that the art of making brick was then "carried to such perfection, though it should seem to be but in its infancy, that this vast structure (perhaps the largest house belonging to a subject in the kingdom, now that Audley End has been in part pulled down) has stood the brunt of weather for above three centuries, particularly of the salt corroding vapours arising from the sea, to which it is greatly exposed, without suffering the least injury in any part of the walls, insomuch that hardly a single brick shows the least marks of decay."

At Herstmonceux the bricks are supposed to have been the work of the Flemings, introduced by Sir Roza Fienes, who constructed the castle, and are admirable specimens of uniformity and firmness, the walls even yet, where uninjured by violence, being perfectly sound, and almost the only stone to be seen in the building, except a small portion in some of the interior walls, is to be found in the window frames, mouldings, and battlements. The name "Herstmonceux" is from the Saxon word "*herst*," signifying "a wood," and Monceux from Waleran de Monceux, the first possessor associated with the name of the place.

Most visitors to Hastings run over to Battle Abbey, open on Tuesdays only, distant about seven miles on the direct London Road, and a favourite drive during the summer. In our case we approach it by the South Eastern Railway, Battle Station, being on our way to Etchingham for Hawkhurst. After inspecting the abbey, a pleasant drive of about five miles brings us to Normanhurst, the seat of Lord Brassey, also open on Tuesdays. On this occasion, however, we were informed before leaving Battle that for the present the hall was closed to the public; we were, however, courteously admitted, as members of the Society, on presenting the order previously procured for us by the Secretary, and shown through the greater part of the house, notwithstanding several members of the family were at home. The hall is beautifully situated in the midst of lovely scenery, commanding magnificent views of the surrounding country, but its principal attractions are the various curios collected by Lord and the late Lady Brassey, whose interesting book on the "Voyage of the Sunbeam" had made us familiar with the place. The house itself is quite modern, being erected about twenty-eight years ago, and from an octagonal tower which rises from the south-west can be seen Battle Abbey, the town and castle of Hastings, and the whole of the Channel from the South Foreland to Beachy Head.

Continuing our railway journey from Battle a short ride brings us to Etchingham, where we find awaiting us a well-equipped conveyance, and, obtaining a lovely summer's drive of five miles through some of the finest undulating scenery in England, we reach the Queen's Hotel, Hawkhurst. This quaint but comfortable old-fashioned ivy-clad hostelry, situated in its own grounds, is approached from the main road by a short, winding carriage drive with entrance at both ends, and in front of the house are beautiful flower gardens, now clothed in all their summer loveliness, not the least conspicuous being numerous Gloire de Dijon roses still blooming profusely, and which seem to be in almost every garden, large and small, in this part of the country, one's attention in driving along the roads being not unfrequently diverted by these lovely plants bearing a profusion of blooms covering the entire front of a roadside cottage, and some of them even on the roof. The hotel, although so far from the nearest railway station, is largely visited, owing to its favourable situation, both by the archaeologist and artist, the drives and scenery in the neighbourhood being particularly interesting, the hotel itself commanding most beautiful and extensive views of the surrounding country. Every provision is here made for the tourist, including ample lawn tennis ground, and all the other comforts of a first-class hotel, excellent posting accommodation, not forgetting the unremitting attention of its very courteous and intelligent proprietor.

The morning after our arrival we drive to Glassenbury, the seat of Major Aitken Roberts, entering the park at the upper lodge where we leave the carriage to join it about a mile further down the road. Glassenbury (not to be confused with Glastonbury) is a fine old square mansion standing in a well-wooded park of stately trees, surrounded by a deep moat of clear water some distance from the house itself, and crossed by a picturesque castellated stone bridge. Being provided with an order we were courteously shown through the entire building, wainscoted throughout with old oak and containing a large collection of armour and oil paintings, both ancient and modern, and other interesting curios in the shape of old carved ivory, etc., from India and China. Leaving the mansion, we pass down what is known as the "Lime Avenue," a magnificent and lofty arch, formed by an immense number of these stately trees of almost perfect growth and extending to a distance of not less than 120 yards. Passing the pretty lake, we leave the park and drive to Goudhurst (in old parish registers spelled as now pronounced as Gowdhurst), calling upon the Rev. J. S. Clarke at the Vicarage on the way. By this gentleman and his good lady, thanks to our

honorary secretary, Mr. J. D. Wilde, we were most courteously received and conducted through the beautifully situated grounds at the back of the house, where a pleasant half hour was spent in viewing the magnificent surrounding scenery from this elevated position with the aid of the vicar and his very fine modern-constructed long distance telescope—the moving sails of the windmill at St. Leonards, distant 20 miles, being clearly discernible! We were also kindly shown through the fine old parish church, recently restored at considerable expense. Our attention was drawn to a curious monument in this church, on the front part of which are carved the effigies of father and mother kneeling in an attitude of prayer facing each other with their thirteen children. Under the father at the foot of the monument are the five sons, under the mother the six daughters all in a row, but where are the missing two? Few people are able to find them—but either owing to want of space or their having died in infancy, they are placed at the knees of the parents, and although very small within full view of the bewildered spectator.

A magnificent bird's-eye view of the surrounding country is had from the tower, which we ascend. Resting awhile at Launterhurst—at the Chequers Inn, a somewhat curious sign, but by no means uncommon in this part of the country, having met with it at several places, notably at Canterbury, the old house there being commemorated by Chaucer in his “*Canterbury Tales*,” being built in the form of a square or quadrangle, having an open court in the middle, some traces of which still remain, situated at the S.W. corner of Mercury Lane and High Street.

The Chequers Inn at Canterbury was a house much frequented by pilgrims, and it appears to have been built in suites of rooms projecting in front over one another and supported by pillars forming a colonnade, which have since been removed. A portion of the old Inn is now occupied by Mr. Skinner, draper, and is now known as Grafton House; the old vaulted cellars are very perfect, having undergone little or no alteration since the days of the pilgrimage.

Through Mercury Lane, the pilgrims from all parts of Christendom directed their steps to the Shrine of St. Thomas in the Cathedral close by, as Chaucer tells us:—

“And specially from every shire's end
Of Engle land to Canterbury they wend,
The holy blyssfull Martyr for to seek
That them both hopen when they were sick.”

—*Chaucer's Canterbury Tales.*

We then drive to Bayham Abbey. Leaving the conveyance at the lodge gate, a gentle descent of about a mile through the park brings us to this interesting pile of ruins, situated in a peaceful valley alongside a pretty sheet of water and surrounded by lovely, undulating, woodland scenery. Built about the year 1198, in the reign of Richard the First, the ruins are now the property of the Marquis Camden. The abbey was at one time ceded to Cardinal Wolsey, and afterwards transferred by Queen Elizabeth to Viscount Montague. Eventually it was bought by John Pratt, Chief Justice of the Kings Bench in 1714, from whom it descended to its present owner.

Returning to Launterhurst, pleasantly situated on the banks of a stream, which divides the counties of Kent and Sussex, and passing through Scotney Park, it skirts the ruins of Scotney Castle, which we shortly reach, and after presenting the card of Mr. Hussey, the proprietor of the estate, at the hall, which is beautifully situated on a commanding eminence and built in the Tudor style, we were courteously directed

through the grounds to the castle at the foot of the hill. It originally consisted of four towers, only one of which in fairly good condition now remains, surrounded by a deep and spacious moat, and in the midst of a beautifully wooded park, through which we afterwards drive, returning to Hawkhurst by way of Flimwell, passing the three entrances to Mr. Goschen's residence, the entire distance of about 20 miles being through very richly-wooded scenery.

We spend the following morning in and about Hawkhurst. Many years ago this place, situated in what is called the Weald, was the centre of a large and prosperous iron industry, one of the proprietors being William Penn, the Quaker, though there is no mention of his ever having resided here. Commemorative of this industry we still find in the immediate neighbourhood such names as Furnace Mill, Furnace Field, Furnace Farm, Gun Green, whilst the rising ground to the south-east of Furnace Mill, near the mansion of Wm. Cottrell, Esq., was formerly called Hammer Hill, and at the death of the proprietor, in 1718, it was called the Tongs. About the time of Queen Elizabeth, Hawkhurst was also the seat of a considerable industry in the clothing trade, but there are now no remains whatever of either of these industries, the entire face of the country being purely agricultural. We visit the quiet old parish church of St. Laurence, at Hawkhurst, with its seven memorial windows of stained glass, and the beautiful east front, which is generally allowed to be the finest piece of architecture within the Weald. One of these stained windows is erected to the memory of Sir John Herschel, who resided at Collingwood, a short distance from the church, in pursuit of his favourite studies, for over thirty years, where he died May 10th, 1871, and was interred at the east end of the north aisle of Westminster Abbey. The neighbourhood of Hawkhurst also contains the residences of Viscount Cranbrook, from which place the title is taken; of Edward Hardcastle, Esq., New Lodge, late Member of Parliament for one of the divisions of Salford; also at Lillesden, of the late Lieut.-Colonel E. Lloyd, well-known in the early stages of the Volunteer movement as a former colonel of the then "First Manchester Regiment." Our morning's ramble was brought to a close by witnessing the process of hop-drying in the kilns, a process quite new to us, hop-picking having just commenced in the district.

Any visitor to the county of Kent for the first time cannot fail to observe those curious-looking buildings, one or more being attached to almost every farm, which are used for drying hops, called oasthouses. Built of brick and of circular construction, somewhat lower than the ordinary windmill, they are surmounted by a peculiarly carved overhanging wooden construction, somewhat resembling the cowl of a monk so as to move round the top and to respond to the action of the wind for purposes of ventilation, without causing too powerful a down draught. Seeing the door of one of these buildings open, we walked in, and were courteously shown the entire process by the drier, a man who must have had considerable experience at the work. On the ground floor is the oven or stove, the fumes of which upon first entering the building were rather stifling; the drier's art, amongst other things which we did not elicit, containing a judicious admixture of sulphur for colouring purposes, which gives to the hops a rich golden shade. Ascending to the loft we find several hundredweights of hops in what appears a large tank, undergoing the stoving process from the influence of the heat below. It may be mentioned that this was the first produce of the season's picking in the neighbourhood, and unless the hops are very carefully manipulated during the process, the entire contents of the kiln may be easily rendered unmarketable, particularly if the stove is allowed to become too hot.

In the afternoon we have a very pretty drive through the village of Sandhurst to Bodiam Castle, returning by way of Silver Hill and Hurst Green, the views from the carriage road in this locality being remarkably extensive and fine. Bodiam Castle

stands in a secluded spot about five miles east of the Etchingham station, on the South-Eastern Railway, and is probably one of the most frequented of the many ruins in the district. Timbs tells us, in his "Abbeys and Castles of England and Wales," that "the licence to fortify this almost perfect specimen of the fortress of the Plantagenet period bears date 1385, and is the finest and almost only instance of leave being given to *make* a castle. The term 'for resistance against our enemies,' as stated in the licence issued by Richard II., was no idle one, for the French had within the last twenty years repeatedly ravaged the neighbourhood of Hastings, Fairlight and Winchelsea; eight years previously had besieged the valiant Abbot of Battle in that town, and in 1380 they burnt Rye, Winchelsea, Hastings and Portsmouth."

The castle is rectangular, being 150 feet north and south by 138 feet east and west, and although dismantled during the civil wars in the reign of Charles I., is still in a remarkably good state of preservation. It is protected at each angle by solid massive towers, which, with the walls, rise direct from the water, being entirely surrounded by a moat ranging in breadth from thirty-five to sixty-five yards, and is approached by a bridge leading to the main gate in the north front. The style of this building is severe, and undoubtedly, as the licence states, conveys the impression of having been erected more for defence than as a place of residence, the provision in this respect being limited.

Our last day embraced a long and very interesting drive along the High Street Road and Flimwell (Mr. Goschen's residence previously mentioned). Here we leave the road and pass through the lodge into Bedgebury Park, the property of Mr. Beresford Hope. The drive through this beautiful park, the greater part of which for about three miles is thickly wooded with tall and stately pines and firs, whose ample shelter from a scorching sun, was doubly acceptable. The ground also is thickly covered with brushwood and bracken, and in many places heather, affording excellent cover for large numbers of tame pheasants, also squirrels, many of which were skipping about both in the trees and in some instances on the road close to the conveyance.

On reaching the quaint old market town of Cranbrook, the capital of the Weald, we of course visit its ancient parish church, with its numerous brasses, banners, and gauntlets. Over the porch on the south-west is a small upper room, formerly used as the priests' lodging, and communicating with the interior of the church by a low door at the head of a short flight of steps. Another curiosity, not often seen elsewhere, is the baptistery for total immersion. Cranbrook was formerly a place of considerable importance, being the seat of a large business in the manufacture of woollen cloth, introduced into England by the Flemings about the time of Edward III., some of their quaint old houses formerly used for that purpose being still in existence, whilst many other extremely interesting old-fashioned houses, both public and private, stand out prominently by the irregularity of their construction, with their wooden gabled fronts, low doors, and square bay windows, with small panes, extending some distance into the street, all suggesting an air of comfort and contentment to a degree not met with in the present day. A similar type of this house was met with at the Bull Hotel, where we lunched, and afterwards left for Sissinghurst Castle, regretting that time did not permit us to see more of the place.

The ruins of this ancient fortified manor house, traceable to Edward III.'s time, now consist of a series of dismantled farm buildings in a state of partial decay, and owned by a family named Newes. It was built by a member of the Saxenhurst family, in whose possession it remained for many years, the name afterwards being changed to Sissinghurst. At the end of the last century it was used for the confine-

ment of the French prisoners, whence it gained the name of Sissinghurst Castle. The chapel, now used as a barn, appears to possess a separate history, being founded by John de Saxenhurst, and re-edified by Sir John Baker, Bart., in the reign of Charles I., who, according to Hasted, in his "History of Kent" (vol. 7), "by a deed delivered in 1627 to John Bancroft, Bishop of Oxford, and dedicated as it was before to St. John the Evangelist, upon which it was consecrated by the bishop with the usual ceremonies and benedictions." There still remains a lofty tower, roofed and fairly well preserved, from which a magnificent view of the surrounding country is obtained for many miles. On entering the former chapel we were met by a troop of young pigs, who evidently considered that safety consisted in flight—truly a sad contrast to its sacred use in former days. The original courtyard has now become an orchard, the draw-well being replaced in the same site by a pump, and distinct traces of a wide moat are still to be seen. Doubtless, like many other visitors to these extensive and interesting ruins, we could not but compare, with considerable regret, the former building and its old historical associations, with its present condition, and the purposes to which several of its buildings are now appropriated.

These little daily drives from Hawkhurst embracing as they did glimpses of some of the most beautiful and varied scenery in the county of Kent, not inaptly termed the Garden of England, and favoured as we were with delightful weather from start to finish, were very enjoyable. There appears to be something extremely interesting and attractive—not to say refreshing—in penetrating a country of such historical interest, under such favourable circumstances, where almost every turn of these well kept roads is a picture in itself. At one time we are favoured with gentle slopes on either side, in places thickly timbered with stately elms, beeches, or chestnuts, whose luxuriant foliage is just beginning to indicate the early approach of autumn with its harvest and hop-picking. Along the sides of these slopes also may be seen acres of the graceful hops, supported on tall poles placed in continuous rows the entire length of the field, to which for a height of eight or ten feet, the hop bine, with its tender pale green foliage, gracefully clings. In several places on the road side may be observed thorn edges trained to a considerable height, from twelve to fifteen feet, carefully trimmed and cut back at the sides so as to afford shelter to the hops from the effects of the wind.

On the summits of these slopes, and in many cases some little distance from the neighbouring villages, may be seen amongst the trees numerous old parish churches; in fact, it appears to have been quite the custom to erect them on the high ground, and nearly all with square massive built towers, castellated and strongly buttressed at each corner, many of them being also surmounted with a smaller tower for purposes of observation. A large number of these churches may be seen from the tower of Sandhurst Church on a clear day. It is stated between forty and fifty.

Not the least interesting amongst the many attractions of this favoured district, is its enormous production of fruit. Wherever a farmhouse or cottage was to be seen as we drove along the roads—and all conveying the appearance of comfort and plenty—there were in addition to the familiar looking oasthouse, immense numbers of lovely tinted apples, also pears and plums, the crops everywhere being immensely heavy, and the remarkably fine hot summer rendering the complexion of many of the apples, exceptionally brilliant and attractive.

An agreeable drive back to Hawkhurst, through the pretty village of Bennenden, passing Lord Cranbrook's seat, a good view of which is obtained from the high road peeping out amongst the trees, brings our day's drive of about twenty-two miles to a close, and with it terminated in an extremely pleasant manner our holiday in Kent and Sussex.

The 263rd Meeting of the Society, held at Ripon, on Saturday, August 26th, 1893.

A party of members, joined by Dr. J. Douglas, of St. Ninians, were permitted by the Marquis of Ripon to see the beautiful park, gardens, and the ruins of Fountains Abbey. They were guided over the park by the head gardener, and the abbey and grounds were described with great care and minuteness by Mr. Mason. The widespread influence of the abbey was referred to, and the severe architectural features admired.

The old trees planted centuries ago and now standing almost bare, stood, in their gaunt old age, contrasting very forcibly with the trees planted in this century and the beautiful effects of the modern landscape gardener. The blending of wood and water, the rolling greensward and the steep cliffs, with the view closed by the abbey ruins, is one not to be forgotten. The *Wellingtonia gigantea*, the beautiful holly hedges of great height, with here and there charming vistas through their greenery, and the one stately, solitary tree, planted by the Queen many years ago, all added to the charm of the visit.

Ripon Cathedral was then visited, and some time was spent in examining this fine Early English building, and in comparing it with other Yorkshire cathedrals.

After tea, Mr. ROSKILL moved a very hearty vote of thanks to Lord Ripon and to his agent, Mr. Mason, for their great kindness to the members. Dr. DOUGLAS seconded the motion, which was supported by several members, and carried. A short time was spent in viewing the city, and the return was made in good time.

The 264th Meeting of the Society, held in Saddleworth, Saturday, September 2nd, 1893.

Mr. THOMAS DENTITH took charge of the members at Greenfield, and conducted them to Bill's-o'-Jack's and over the moors to Saddleworth Church, and thence to his house at Dobcross.

The beautiful valleys of this part of Yorkshire were, on this sunny day, very much enjoyed; the great moors crowning the steeps were in full view, and with the heather in flower appeared very striking in contrast to the deep water-worn gorges in sombre shadow.

Saddleworth Church was inspected. Its painted windows, old stocks, on the stone post of which the date 1687 is inscribed, and some quaint inscriptions in the graveyard, were pointed out.

Arriving at Dobcross the party was joined by Dr. Ramsden, whose descriptions of the people of the district added a large element of interest to the pleasant evening that was spent. Very hearty thanks were given to Mr. and Mrs. Dentith. Alderman BOWES, Mr. SNADDON, Councillor HAMPSON, Mr. HARKER, and others spoke on the motion. Mr. DENTITH, in acknowledging the vote, expressed the pleasure afforded to himself and Mrs. Dentith in receiving the members, and hoped to see them again at a future time.

The 265th Meeting of the Society, held at Leeds, Saturday, September 9th, 1893.

By permission of the Hon. Mrs. Meynell-Ingram, the members had the opportunity of viewing the park, gardens, and hall of Temple Newsam.

The party took carriages on arriving at Leeds, and drove to Whitkirk to see the old church, the memorial to Smeaton, and the tombs of the Ingrams. Then, seeing the old study of Smeaton, and driving through the park they found their way to

Templestowe. The beautiful picture gallery, with its choice Venetian, Dutch, and English paintings; a bronze bowl of very early date, the splendid Japanese cabinets, and the other riches of the house were carefully examined. The curious construction of the building was noted, the somewhat plain exterior contrasting with the great beauty of the internal decoration.

The garden in front of the house was very rich in flowers—a mass of colour. It was very much admired, and also the great and almost natural park.

Mr. J. T. Ogden took the chair, and very hearty thanks were given to Mrs. Meynell-Ingram, to Mr. Little, and to all who had assisted in making the arrangements for the day.

On the return journey to Leeds by another route, the party unwittingly drove through a great colliers' meeting. Manchester was reached in good time.

The 266th Meeting of the Society, held at Nottingham, September 13th, 1893.

A number of members were present to attend the British Association Meeting, and some good resulted to the Society through the members who attended the various sections.

THE BRITISH ASSOCIATION AT NOTTINGHAM IN 1893.

REPORT OF THE DELEGATES.

The meeting at Nottingham was not a very large one, but it was very much enjoyed by those who were present. The town itself is interesting; the site of the castle with its caves, the new wide streets, the large spaces for recreation, the parks, the beautiful Arboretum with its aviaries, and a very fine collection of stately new buildings for municipal and collegiate use, its large and interesting market place, and the historical associations of the town all helped to make the visit a very pleasant one.

Unfortunately the charges for accommodation were very high; so much was this felt that a good many members left the meeting on Saturday and did not return. Your delegate had the good fortune to be the guest of the Rev. F. and Mrs. Bavin, who did all they could to give pleasant recollections of the visit.

The usual excursions took place—to the Dukeries, to Charnwood, to Derbyshire, and to the grand old Minster Church of Southwell, and even further afield. The hospitality of the town was gracious and generous, and the various lace, tobacco, mechanical and other works opened to view were of great interest. The paper by Mr. Mortimer on Lace Curtains, which had been reprinted from the "Journal," was presented by the Society to all the delegates at the suggestion of Mrs. Leech, and was highly appreciated.

The visit to the Gas Works was instructive and valuable, and it was interesting to find that their high state of efficiency had been brought about by an engineer who was at one time in the Manchester Gas Works.

The town is now a large one, having been enlarged by the taking in of the suburbs for a considerable distance, and the people are on the whole very well dressed and quite Parisian in their ways and habits. The run of life is entirely different from that experienced in our colder climate. The large outdoor conveniences for enjoyment probably account for this.

There was a fair attendance at both the delegate meetings, and various subjects of interest were discussed—Meteorological Photography; Geological Photography (the committee have now a very large and valuable collection); a discussion on Examinations in Geography and the Question of Ordnance Maps; the Ethnological

Survey of the Kingdom ; Earth Tremors ; Underground Waters ; Protection of Wild Birds Eggs ; Museums, Exploration of Antient Remains, and other subjects being reported upon.

In Section E. (Geography) no very startling papers were read. A very useful discussion between Section E. and Section C. took place on "The limits between Physical Geography and Geology." Some of the papers were of considerable interest.

The Hausa address of Mr. Robinson ; the Dundee Whalers' Reports of their Proceedings in the Antarctic ; and Progress in East Africa, were probably the most interesting. Section E. appeared to be the most popular of the Sections, and it was not over burdened with work.

Professor Milne's address on Earthquakes in Japan was given in another Section and was exceedingly valuable, and Mr. R. D. Oldham's address on the Geology of India, at which was exhibited a new Geological Map of India, was very interesting, as was the description of lake dwellings, recently discovered at Glastonbury.

Your delegate had an excursion to see the Hemlock Stone, a large water-worn rock standing some 30 feet above the hill side where it is situate, of hard sandstone, and also Dale Abbey Ruins, the adjacent Old Parish Church, and the Rock Cave of Scott's Friar Tuck. The Old Parish Church existed before the Abbey, and is still used, whilst nothing but the outlines of the East window of the Abbey survives. Some old but mutilated Norman work survives in the Church, and it is a most curious place. There are two stories with a hole cut in the floor of the upper story for those who may be occupying it to see the parson. The entrance to the upper storey is by a flight of stone steps outside. Under the same roof is a farmhouse which was formerly a public house, and a door (now made up) formerly opened from the Church into the public house. The Church was first built for the use of a hermit, and the arrangements made (traces of which can still be seen) allowed him to take part in the service of the Church, built against his hermitage, without being seen. The Church is very small and has an antient Bishop's Chair, greatly ornamented, and a large Norman font. It is one of the most interesting and curious remains about Nottingham.

A large number of Committees were formed, some with money grants and some without. The delegate has already entered into detail in reference to these Committees, and will be glad if any of the members find themselves able to give any assistance. He will be glad to give any information respecting them and place the members in correspondence with the secretaries of the Committees.

The Committees of most interest to the members of a Geographical Society will probably be the following : Erratic Blocks of England, Wales and Ireland ; Earth Tremors ; Exploration of Calf Hole Cave, Skyrethorne ; Zoology of the Sandwich Islands ; Climatology and Hydrography of Central Africa ; Geographical &c., Exploration of South Georgia, Antarctica ; Exploration of Hadramaot, Arabia ; The Ethnographical Survey of the United Kingdom ; The Rate of Erosion on the Sea Coast of England and Wales ; Volcanic Phenomena of Vesuvius ; Investigation of the Cave of Elbolton, near Skipton ; Excavations at Oldbury Hill in search of rock shelters ; Legislation Necessary to Protect Wild Birds' Eggs ; Scottish Place Names ; Teaching of Science in Elementary Schools ; The Physical Character, &c., of the N.W. Indians of Canada ; Uniformity of Spelling of Barbaric and Savage Languages and Race Names. These, with others, form the Committees who are at work during the year, and they will be glad of such help as may be possible in any way from our members.

The next meeting of the Association will be held at Oxford, in August, 1894, and will be presided over by the Marquis of Salisbury. There will, no doubt, be a very large attendance at that meeting.

The 267th Meeting of the Society, held at the Exhibition of Egyptian Paintings in the City Art Gallery, Saturday, October 7th, 1893, at three o'clock.

Miss A. E. F. Barlow received a large number of members, and after a preliminary address on the work of the Egypt Exploration Fund, who had arranged the Exhibition, explained the drawings and sketches on view.

Numerous questions were asked, and Miss Barlow was listened to with very great attention. Thanks were passed to her for her admirable and instructive address.

The 268th Meeting of the Society, held at the Athenæum, on Wednesday, October 11th, 1893.

The members were received at six o'clock, and collections of maps, books, and photographs added to the library, and photographs lent by Mr. J. M. Molesworth, C.E. and Mr. Harry Lee were examined. Lantern views were exhibited from the Egypt Exploration Fund and some of the new slides of the Society. Music was kindly rendered by Miss Edith L. Webster, L.L.C.M., on the piano, which was very much appreciated.

At eight o'clock the Principal of Owen's College (Dr. WARD) took the chair, when Mr. CLEMENTS R. MARKHAM, C.B., F.R.S., President of the Royal Geographical Society, addressed the members on "Trade Routes through the Himalayas," illustrating his address with lantern views and a map lent by the Royal Geographical Society.

Questions having been asked and replied to, Mr. MARK STIRRUP proposed, Mr. R. WADE seconded, and Professor SCHUSTER supported a vote of thanks to Mr. Markham, who responded and made graceful reference to the work of the Society.

Thanks were passed to Dr. Ward, on the motion of the Very Rev. Dr. CASARTELLI, seconded by the Chevalier FROELICH. Some light refreshments and a further exhibition of lantern views brought the meeting to a close.

The following letter was read to the members from Captain Casati, the Italian explorer :—

Cortenova, Brianza,

18, Luglio, 1893.

ILLUSTRE SIGNORE,—Io l'onore di accusare ricevuta della carta di nomina a Membro corrispondente della Onorevole Società Geografica di Manchester.

Riconoscente per tanto onore conferitorni, io prego V. S. di volere essere interprete di Miei venti di ringraziamento presso l'illustre Presidente e gli illustri Membri ed ufficiali della Società Geografica.

Ella, illustre Segretario, in un col più sincero ringraziamento s'abbia un cordiale saluto.—Dev'm.

(Signed),

G. CASATI.

The 269th Meeting of the Society, held in the Lord Mayor's Parlour, Town Hall, on Wednesday, October 18th, 1893, in conjunction with the Chamber of Commerce. Mr. SAMUEL OGDEN, J.P., President of the Chamber and Vice-President of this Society took the chair, in the unavoidable absence of the Lord Mayor.

THE CENTRAL SUDAN.

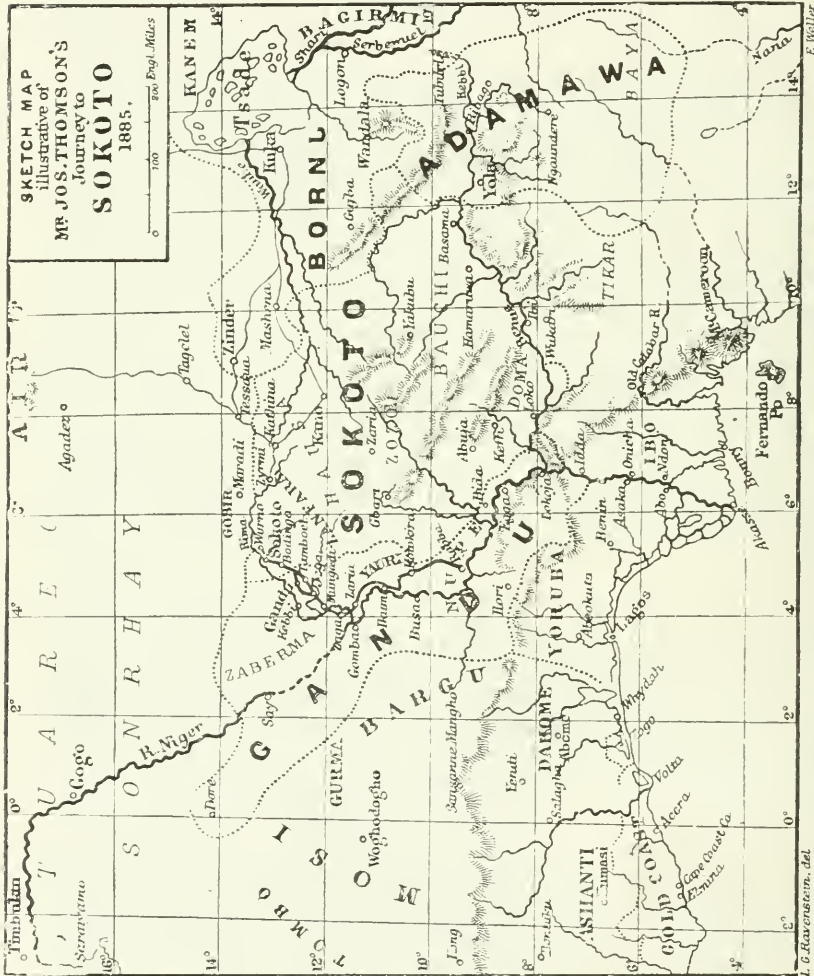
THE HAUSA ASSOCIATION.

The Rev. C. H. ROBINSON, M.A., the newly elected Hausa scholar, who has spent a season in Tripoli studying the language and obtaining information from the desert caravans, addressed the meeting.

The following papers referring to the object of the Hausa Association were read :—

THE OBJECT OF THE ASSOCIATION.

The aim of the Association is to carry on the work begun by the Rev. John Alfred Robinson, by providing for a scholarly and scientific study of the Hausa language,



This Map, reprinted by permission of Mr. J. Thomson, illustrates the position of the Hausa people. (See address by Mr. Thomson, *Manchester Geographical Journal*, vol. ii., p. 5.) In the Library will be found a number of photographs of the Hausa by Mr. Thomson and Mr. Rowland.

with a view of promoting the higher interests of that people, and of translating the Scriptures and other appropriate literature into their tongue.

To explain the importance of their aim something must be said about

- (1) The Hausa tongue and people.
- (2) Mr. J. A. Robinson's work and conclusions.

THE HAUSA TONGUE AND PEOPLE.

Hausa is the *lingua franca* of the Central Sudan, extending from the Sahara to the Pagan tribes near the Gulf of Guinea, and from the Egyptian Sudan to the French colony of Senegal. The greater portion of this region has lately been secured to British influence by treaties and international agreements. It is estimated that not less than fifteen millions of persons speak the Hausa tongue, and many of these can read and write it in a modified form of Arabic character. The importance of the Hausa language was fully appreciated forty years ago by the traveller, Dr. Barth, who endeavoured to promote its study, but with only partial success. The Central Sudan having been until lately isolated from European intercourse, the materials necessary for the accurate study of Hausa do not exist in Europe. A grammar, a dictionary and a reading book were compiled some years ago by a German Student, Dr. Schön. So important were these early efforts considered to be that the University of Oxford granted him their honorary degree in recognition of them. A grammar and vocabulary in French has lately been brought out in Algeria. Portions of the Scriptures have also been translated into Hausa. But these, being all first efforts, call for improvement. The book which best gives the idioms of the vernacular is the "Magana Hausa," which was taken down, for the most part, from the dictation of a native. The Hausa language is rich in words, and presents a special interest to philologists on the open question of its alleged connection with the Semitic group. The Central Sudan States possess a certain civilization of their own, which can hardly be interpreted aright except by those who are familiar with the prevalent language, which is Hausa. The dominant races are remarkably intelligent, but as the social system in the Central Sudan is chiefly based upon slavery, the great mass of the population exists in a condition of ignorance and insecurity which forms a striking contrast with the well-being of the slave owning classes. The internal commerce of these regions is mainly carried on by the Hausa race proper, whose caravans travel northward to the Mediterranean, eastward to the Red Sea, southward to the Gulf of Guinea, and westward to the Atlantic. They would thus be powerful agents for disseminating over vast regions and amongst dense populations whatever ideas Europeans may succeed in planting amongst them. These Hausa traders are courteous in manner; they profess the Moslem religion, which has been outwardly imposed on the Central Sudan by the conquering races, but they are free from bigotry and open to argument. In pursuing the study of their language scientifically while in touch with the natives, it is evident that many facts of anthropological, demographic, and other interest will come to light.

MR. J. A. ROBINSON'S WORK AND CONCLUSIONS.

Mr. J. A. Robinson's missionary work on the Niger dates from 1886, but during the last two years of his life, he devoted his attention mainly to the Central Sudan. Having acquired the Hausa language, he lived among the people in a manner calculated to disarm suspicion and promote good understanding by close and friendly intercourse, and successfully demonstrated that much could be effected on the lines which he had laid down. Before his death he had concluded a careful revision in Hausa of the early chapters of the Gospel according to St. Matthew, and he has left various notes and materials which will doubtless be of value to future students. His experience convinced him, first, that no satisfactory work of any kind could be carried on amongst these races without careful study of Hausa, in order to ascertain their modes of thought and communicate European ideas to them without fear of misunderstanding; secondly, that, in respect of mission work, the most effective method would be to place within their reach an accurate translation of the Scriptures into their own

tongue; and thirdly, that this initial work, important as it is, would be incomplete unless it were given continuity and growth by providing instruction to students, and thus gradually disseminating a knowledge of the Hausa language amongst the Europeans who may henceforth visit those regions for missionary, administrative, or commercial objects.

THE METHOD OF THE ASSOCIATION.

To secure the objects of the Association, the Executive Committee decided to appoint a "Robinson Student" to study the language and customs of the Hausas, and to gather materials for the translation of the Scriptures.

After the careful consideration of numerous applications in answer to advertisements inserted in leading scientific, literary, and religious periodicals, they determined to invite one of Mr. Robinson's brothers, the Rev. Charles H. Robinson, M.A.—a man of academic distinction, varied experience, and tried capacity in Oriental travel—to be the first "Student" of the Association.

He has received instructions to proceed with as little delay as possible to Kano, and to other large towns in the Central Sudan, where the Hausa language may best be studied.

As, however, the climate throughout a large portion of the Hausa territories is such that any very prolonged stay would endanger the completion of the project, it was thought better that he should spend some time in a preliminary study of Hausa and Arabic in Tripoli or Tunis before proceeding into the far interior.

The following occasional paper, No. 2, placed at our service by Mr. Robinson, was read:—

The first occasional paper was issued in May last. For about a month after this I stayed in Tripoli, studying the Hausa language with a Hausa native, Abu Bekr, who was staying for a while at Tripoli, on his way from Mecca to his native city, Bida. The story of his life, which he dictated to me in his own language, affords an interesting example of the travelling propensities of the Hausa people. Eight years ago he left Bida, a town near the junction of the Rivers Niger and Benue, in order to perform the pilgrimage to Mecca, taking with him his wives and family, a party of 17 in all. He travelled northwards to Kano, and thence to Kuka, on Lake Tchad. After a delay here of four or five months, he started for Khartoum, *via* Wadai and Darfur. In the former district his party were captured and treated as slaves for upwards of a year, but having eventually regained their liberty on the plea that they were pilgrims, and as such could not be lawfully detained, they arrived at Omdurman, opposite Khartoum, shortly after the capture of the city by the Mahdi, and the death of General Gordon. After spending a month in the Mahdi's camp, he resumed his journey through Abyssinia to the Red Sea. Owing to the difficulties here encountered, another year elapsed before he reached the coast at Suakin, whence he travelled by steamer to Jeddah, the port of Mecca. After performing the rites of the pilgrimage, which occupied a month, his resources were so far crippled that he was compelled to remain at Mecca for four years, at the end of which time, having replenished his own resources from those of subsequent pilgrims, he returned to Jeddah, and went by steamer to Suez. From thence he walked to Alexandria, and came by ship to Tripoli. Having spent a year there in collecting money, chiefly by the sale of charms, in order to enable him to continue his journey once more, he has recently started with those who still remain of his original party to complete the return journey to Bida by crossing the Great Sahara Desert, a distance of somewhat more than 2,000 miles. Should he meet with no unforeseen obstacles, he will reach his home in about a year's time, and will then have completed a journey of nearly 7,000 miles, which will have occupied about 9½ years. The above story, which might be paralleled by hundreds

of others more or less similar, illustrates alike the travelling instincts of the Hausa people, and the important part which the pilgrimage to Mecca is playing in the history and perhaps the gradual civilisation of the Western Sudan. It is by no means an uncommon occurrence for as many as 1,000 pilgrims from the far interior to pass through Tripoli in one single day on their way to Mecca, nor would these form more than a tithe of those who start yearly upon the pilgrimage.

On June 7 I left Tripoli on a preliminary journey of enquiry along part of the northern border of the Great Sahara Desert, at the back of Tunis and Algiers. In company with a friend with whom I had been staying in Tripoli, Mr. Hermann Harris, I went by steamer from Tripoli to Gabes. From thence, after a day and a half spent in negotiating the purchase of camels, we started for the interior, taking with us two Hausa servants, one of whom was the son of Abu Bekr, the Hausa pilgrim above referred to.

The following are a few extracts from the diary for the three following weeks :—

June 10. Pitched our tents at an oasis, formed by an artesian well constructed by M. Lesseps, the water from which rises 25ft. into the air, and is made to irrigate 400 or 500 acres of land, on which are grown dates, palms, pomegranates, tomatoes, onions, and cucumbers. Were it not for the well the whole would be barren sand.

June 13. Thermometer to-day registering $107\frac{1}{2}$ in the shade. Soon after starting we encountered a burning sirocco wind, driving fine sand before it. There was nothing to be done but to sit still on one's camel, shut one's eyes, and go straight ahead. The worst of it passed in about $1\frac{1}{2}$ hours. At 6-30 p.m. we halted, having failed to find any well. We had, however, sufficient water in our skins. The water carried in these skins, which, when put in at the well is usually grey, is of a blackish brown colour when served out for drinking. As we had no meat, bread, nor butter, we made our dinner off cuscus and tea.

June 15. Got up at 2-45 a.m.; started at 4-45. Somewhat uncertain as to which direction to take, as we had received several contradictory statements from Arabs whom we had met, to the effect that we had gone astray, and were west of the true track to Gufsa. At 11 a.m. we pitched our tents, the thermometer again standing at 107° in the shade.

June 18. Reached Gufsa last night; a town of considerable size. We failed to hear of any predecessors in the way of English visitors. The luxuries to be obtained *en route* are such as would scarcely prove attractive to a resident in East London, much less to the professional "globe-trotter." One of our Hausa servants deserted us to-day. We are engaging another Hausa man, a native of Zinder, to come with us to Tebessa. He has an honest-looking face, and will, I hope, prove satisfactory. There is a fine Roman bath here, about twice the size of that at Bath, and in fairly good condition; also some stones with Roman inscriptions.

June 21. Started last night at 8-40 to ride through the night. Riding a camel by moonlight is a most strange sensation; the camel looks nearly twice as large as in daylight, and the solemnity of the animal harmonises most curiously with the natural feeling of solemnity which the clear sky produces.

June 23. Reached Feriana at 7-30 a.m. About half a mile outside the place are the ruins of the old Roman town, extending for more than a mile. Four pillars of a temple are standing. No water at present exists on the site of the Roman city.

June 24. Started last night at 9 for march by moonlight. About midnight we crossed a pass in the Atlas Mountains; height, according to aneroid, 4,600ft.

June 26. Visited Roman ruins at Tebessa, in Algiers, which consist of a Prætorium, built in the first century, and converted into a Christian Church in the fourth; a temple of Minerva; an arch of the time of Caracalla; a bath, the mosaic floor of

which is in a wonderful state of preservation ; and many other public and private buildings. As one stood amongst the splendid ruins one could not help thinking what marvellous faith the Early Christians must have possessed when they ventured to set up an obscure Judean faith against the official religion of so powerful and so cultured a state as that of Rome. It scarcely requires as much faith to believe that Christianity will ere long regain its lost influence here, and extend it throughout the whole of Africa.

June 29. Arrived by train at Tunis, distant 200 miles from Tebessa. After sleeping on the ground for three weeks, with dogs barking around within a few inches of one's head, and insects innumerable crawling over one, the luxury of a bed is indelectable.

July 5. Left Tunis for England, *via* Naples, Rome, &c.

About the end of November I shall hope to return to Tunis, to carry on the preliminary study of Hausa and of Arabic, and after a few months there shall hope to proceed to the River Niger, to commence the journey thence to Tripoli.

CHARLES H. ROBINSON.

The Rev. C. H. ROBINSON said that the primary object of the expedition he was about to make was to reach the Hausa States west of Lake Tchad and north of the junction of the rivers Niger and Benue. The great aim in doing this was to study the Hausa language, and try and collect from the natives specimens of literature, and more especially any specimens or remains which bore on the ancient traditions of the people and country. The Hausa people might well claim to be called the most literary of the native races of Africa, so extremely careful were they to preserve everything that was written in their own tongue. Apart from the very interesting philological problem of the possible connection of this language with the Semitic group, it had a unique claim upon them because it was spoken, as they had been told, by such an immense number of people. The Hausa people professed the Moslem faith, but they did not know very much about their religion, and the fanaticism which was so conspicuous in the Eastern Soudan was there almost entirely wanting. It was hoped that one result of the expedition would be to render possible a translation of the New Testament into Hausa ; and if it could be reproduced in the Hausa style of binding, &c., it was believed that a large circulation could be secured through the medium of the caravans. Mr. Robinson proceeded to sketch his proposed route. He should, he hoped, start overland from the junction of the Niger and Benue for Kano, one of the chief centres, with a reputed population of 100,000. Then he hoped to visit Katsena, with 60,000 people, and other chief places, so that he could collect specimens of literature and study the different dialects. Then he would attempt the journey across the Sahara to arrive at Tripoli, the whole expedition occupying something less than two years.

The following addresses were also given :—

Mr. S. OGDEN, J.P., the Chairman, after expressing regret at the absence of the Lord Mayor, who, he said, took a considerable interest in the movement, observed that the district included between Tunis and Tripoli on the north and the Gulf of Guinea on the south comprehended not only a very large area of territory but a population of more than fifteen million people. Amongst that population the Hausa language mainly prevailed, and the whole intercourse and commerce were conducted mainly in that tongue. It would appear that there was scarcely any agency in this country for the study of that language, and the Hausa Association contemplated giving such an opportunity to gentlemen who desired it. At present all that had been done was that Dr. Schön, a German student, succeeded in compiling a dictionary and issuing a grammar of the Hausa language some years ago, and since then a French author had also brought out a grammar and vocabulary. The very large territory concerned

was now placed under the protectorate of this country, and it devolved upon us therefore to take such steps as were necessary to place us in a position to carry out our responsibilities in a manner befitting our standard of colonisation. No doubt at an early period there would be a more intimate intercourse with the Hausa people, and then the caravan routes which now passed over a very large district would become routes of very considerable importance to our commercial enterprise. But there was a higher consideration than that of commerce only, for the Hausa people placed in our care should have provided for them the opportunity of being carried forward upon the path of civilisation which it was incumbent upon us to make our primary object. In view of the rapid increase of the sway of the "white man" over territories which were now populated by darker races, it was highly important that such an association as the Hausa should be helped, in order that the credit and fame of the British as a colonising people should be upheld in the course of action taken with reference to this large African territory that had lately been secured to British influence.

Sir GEORGE TAUBMAN-GOLDIE, chairman of the Executive Committee of the Hausa Association, said he wished to remove a prevalent misconception that their Association was a missionary society. It was undoubtedly true that their project had the sympathy of the Church Missionary Society, and of a good many other missionary bodies, but it had equally the sympathy of the Royal Geographical Society, the Manchester Geographical Society, the Manchester Chamber of Commerce, the Anthropological Institute, the Anti-Slavery Society, and a great many other bodies, which were not directly concerned with missionary enterprise. Their appeal was made to all sorts and conditions of men—to all who shared the well-worn sentiment of Terence, "I am a man, and think nothing human to be foreign to me." Their object was to create a medium of communication with Hausaland. This was no doubt an essential preliminary to successful missionary work there, but it was no less essential to scientific and commercial enterprise and to good government. Although he had put government last, he confessed that to him it stood foremost, because it implied that security to life, liberty, and property without which the other objects he had named could not be successfully pursued. He wished to answer two questions which he thought Manchester people might reasonably put to their Association, and the first of them was, "Is this Hausa language sufficiently important to justify any sacrifice of time, money, and experience?" The Chairman's speech had really given a reply to that query, for he had told them that the language was spoken or understood by about one-hundredth of the whole human race. From that large section of our fellow-men we were now separated by a gulf of ignorance of each other's speech, which it was the business of the Hausa Association to bridge over. Another very strong point in their case was the remarkable characteristic of these Hausa-speaking people of radiating outwards in every direction from their own country into far distant lauds. Mr. Robinson had lately had intercourse with them up at Tunis and Tripoli on the Mediterranean. The Hausa people were to be found as far as the countries bordering on the Atlantic, and they were numerous on the Gold Coast and Lagos, on the Gulf of Guinea. Every year their caravans penetrated further and further south-eastwards into the heart of Africa, and yearly there were pilgrimages to Mecca right across the continent. He himself had an interesting experience concerning these pilgrim caravans, for he travelled for several days in company with one whilst on a journey from Khartoun to Suakin. He learned that that caravan numbered over 800 persons, and he was told also that they had stayed for some time at each of the principal places on their journey, in order to open trade with the natives. With a population like this, travelling in all directions, it was evident that if England could succeed in impressing her ideas upon the Hausa race

she would have a wonderful instrument for their dissemination over at least half the Dark Continent. A second question which Manchester might ask of the Society was, "What special call has England or Manchester to take up this question?" They knew that Northern Africa was more than twice as large as Europe, and fourteen years ago the only portions of that enormous area north of the Equator which were under recognised British influence were the West Coast colonies of Gambia and Sierra Leone and the Gold Coast. To-day, with one notable exception, the same statement held true; for he must not refer to Egypt, or he might be told that we were under a pledge to evacuate that country some day. Fourteen years ago legitimate hopes were entertained that these British colonies would extend inland, and thus carry British influence into the interior; but we reckoned without our neighbours across the Channel. During that period France had pushed laterally from Senegal behind Gambia, which she had reduced to a petty strip of a few square miles, and had pushed to the back of the Sierra Leone colony, whose prospects she had destroyed, and also at the back of the Gold Coast colony, which she had successfully cut off from the interior. It seemed as if the history of Northern Africa had been disastrous to Great Britain; but he had said that there was one notable exception. During the period he was speaking of Great Britain had created a vast protectorate, covering half a million square miles, in the region of the Niger. The protectorate she had secured by nearly four hundred treaties with native States and tribes, and by international agreements which he trusted she would know how to maintain. The predominant language, and the language of the more civilised races, was Hausa, and the whole of Hausaland proper lay within the British sphere of influence. Thus he thought they would see that the Hausa cause was the cause of England, and if of England, then of Manchester.

Major DARWIN cordially recommended the Hausa Association to public support. He referred to the importance of Hausaland from a commercial point of view, and said that the Hausa language was one which it was imperative should be studied. With reference to the scientific aspect of the expedition, it was hoped that a medical man would accompany it, and the country to be traversed was one which presented the prospect of a rich scientific harvest. The Hausas also formed the very best fighting element on the West Coast of Africa. They made faithful and intelligent soldiers, and soon became attached to their officers, so that the study of the language was of decided military value.

Mr. J. ARTHUR HUTTON, chairman of the African section of the Chamber of Commerce, said that that question had come before the African Committee of the Chamber, who went very fully into the matter. They considered that the question was intimately connected with Manchester commerce, and therefore that it was absolutely necessary that the Chamber should take it up and aid it in every way they could. He did not think that any of them realised how fully civilised these Hausa people were. We had been pottering about round Africa for many years, but had never reached this people, and Manchester goods had never got there. We had never approached them either in a missionary or a scientific way, and we knew nothing practically about them. He considered that the object of the Hausa Association deserved the greatest encouragement from Manchester, as being one means—because one must look at these things also from a selfish standpoint—of getting a market for Manchester goods in the interior of Africa.

Mr. J. D. FAIRLEY, formerly a member of the Legislative Council of Lagos, alluded also to the importance of the aims of the Association from several points of view. Notwithstanding that the Association had higher aims than that of commerce, they could not afford to lose sight of the fact that in this great Hausaland there was

[illegible]

a possible outlet for large quantities of Manchester goods, for present markets were congested and our competitors were growing more keen.

The Very Rev. Dr. CASARTELLI expressed his very great interest in the objects of the Association.

The addresses were listened to with great attention, and were illustrated with maps, Hausa manuscript, and various native cloths.

Thanks were heartily passed to the speakers, to the Lord Mayor for the use of the Parlour, and to Mr. Ogden for his services in the chair.

A PAGE OF HAUSA WRITING.

Mr. Robinson has offered to us a page of a Hausa MS which is printed in *fac simile* and presented herewith. The words of the page are :

"Suna tshi tafarki su kua kashi mutane su kua tshi kayansua su kama matane fataki sunka kawo dukia mayawa sunka ba galladima barnuw galladima ya kawo mutane masuyin waza da wakansua da mashida takuba da garkua da nufida da masusulki da kulkuli duka sunka bimu munka tshi gadabi da su mu duka ba mu bi turnba muna kidi tsikin daji kafara ba su fito ba."

And the translation is as follows :

"They occupied the road and killed some men ; they also took possession of their goods and seized the women of the traders ; they captured much spoil ; they gave it to the king of Bornou. He took the smiths and singers, and makers of swords and shields and armour and clubs ; all these followed us. We ate food together with them ; we beat our drums outside in the fields ; the heathen (*i.e.* not Moslems) did not go away."

The following is a note from Mr. Robinson on the page of writing :

"The proof of the Hausa writing has just reached me. A Hausa native in writing this would turn the paper up so that the letter B would stand at the top and D at the bottom. To read it he would turn it round so that the letter A would stand at the top and C at the bottom ; he would then read it from right to left. It should therefore appear so that the side represented by A should stand at the top. The omission of the red points does not matter, as they still appear in black. The writing is a very typical specimen of Hausa writing, several of the letters, as you will perhaps have noticed, being different to the Arabic."

The specimen is the work of Abu Bekr, the man whose story is narrated in the occasional paper in the previous page. The writing is part of his account of his adventures on his way from Bida to Mecca.

The 270th Meeting of the Society, held in the Library, Wednesday, October 18th, 1893, at 7 o'clock. Mr. THOMAS DENTITH in the chair.

The minutes of meetings held May 31st (251), June 3rd (252), 10th (253), 17th (254), 24th (255), were read and approved.

Presentations to the Library and the election of the following members were announced :—

ORDINARY : Messrs. Adolphus Eichholz, Councillor I. Frankenburg, E. Hatton, James Hindle, John Knowles, J.P., Eliot Levy, Arthur Marks, C. H. Scott, J.P., T. Shillinglaw, J. T. Simpson, and Colin R. Strong.

ASSOCIATE : Messrs. John Massey, George Swallow, and T. G. Winstanley.

CORRESPONDING : Captain Gaetano Casati.

AFFILIATED : Manchester Corporation Free Libraries Committee.

A description of the Wedding gift to the President and his Wife, a morocco folio containing photographic views of the Manchester district, and a letter from the Equerry of His Royal Highness, acknowledging the gift, were read.

FROM H.R.H. THE PRESIDENT.

York House,

St. James's Palace, S.W., July 3rd, 1893.

DEAR SIR,—I am desired by the DUKE OF YORK to send His Royal Highness' best thanks to the Manchester Geographical Society for the beautiful photographic folio which they have so kindly sent as a wedding gift to His Royal Highness and Her Serene Highness. I am to assure the Society that their kind present is much appreciated.—I am, &c.,

(Signed), DEREK KEPPEL,
Equerry.

A large amount of correspondence was read, and communications from Mr. Montefiore on the British Polar Expedition, Mr. Fedotoff on Moscow, and others were discussed.

Mr. J. HOWARD REED read a most interesting paper on "The Machakos District, British East Africa," communicated by Mr. John Ainsworth, commanding at that station, illustrated with a map prepared by Mr. Ainsworth. Short addresses were given by members and interesting discussion ensued. Thanks were passed to the readers and writers of the papers.

Permission has been obtained to use these reports of Mr. Ainsworth to the Administrator :—

MACHAKOS, I. B. E. A.

Machakos, 30th Dec., 1892.

To the Administrator, Mombasa.

SIR,—I have the honour to submit to you the following report on Machakos or Ukambani; together with the report I beg to hand you a sketch-map of the parts of the district gone over, showing my various routes in red. The position of Machakos is as fixed by the Railway Survey. This district generally is called Ukambani, the people Wakamba, and the language Kikamba. The various estimates and opinions given are taken from the knowledge, &c., I have gained of the country and its people by my moving about the district :—

RESOURCES.—Ukambani contains no valuable product such as rubber, ivory, &c., that would pay for human transport to the coast. But the country is exceedingly rich in food products and cattle, and were the demand such a much larger production would ensue. Herewith I beg to append a tabulated List of the various grains and other food grown here with an estimate of the present production. (This production of course depends on good rains, &c.)

Name of Food Product.	Estimated Yearly Output for District in pounds.	Remarks.
Matama	2,000,000	Mostly made into flour.
Mwymbi	500,000	Part " " "
Mawili	250,000	" " " "
Mohindi	1,000,000	" " " "
Mhogo (flour)	10,000	
" (root)	(?)	Grown in great quantity.
Beans	2,000,000	Consisting of five or six kinds, besides potatoes, bananas, and various vegetables.

The foregoing only represents the quantity at present obtainable in the district ; what amount is consumed it would be difficult to estimate. At present such products are simply useful for consumption by caravans, &c., but they would, I should think, become a great source of revenue if a railway passed through the district. These are the present resources of Ukambani, but if the demand were permanently increased a much larger supply could be produced.

POSSIBILITIES.—In my opinion *the country is such that any European and Indian cereals, and fruit trees such as apricots, cherries, oranges, vines, &c., would thrive here.* Vegetable seeds (Sutton's) and flower seeds prove quite at home here. This and the immense tracts of country at present uncultivated, on account of marauding Masai, offer innumerable inducements to one to feel certain that *did but a railway traverse this favoured land, Ukambani in time would become one of the food-producing countries of the world ; independent of this, cotton, indigo, &c., could, I should think, be cultivated here.* Protection against Masai to Wakamba enterprise means, with cheap and quick transport to the coast, a future mine of wealth to those who undertake the protection, and, beyond any doubt, the surest preventative against pillaging Masai would be a railway. One very favourable point with the Wakamba is that they have few prejudices, and in the matter of introducing cereals they would give every help ; lately I have given out to the people green peas, beans, &c., which are coming on well.

NATURE AND FEATURES OF COUNTRY.—Ukambani, generally speaking, is a mountainous country, surrounded by vast plains and well watered. The highest altitude is about 7,000 feet above sea level, the lowest about 3,800 feet ; the average altitude is about 5,000 feet. There is a scarcity of good timber, but plenty of building stone. Taken on an average about half the district is under cultivation. The country is thickly populated. The huts are built of grass and are of a conical shape ; ten to twenty huts are generally clustered together in one Bhoma, consisting of grain stores and living houses ; these Bhomas are generally protected by a thorn hedge, and when possible screened from observation. The general inclination of the watershed of the country is S.E. by E.

PEOPLE, &c.—The people generally are very industrious ; all old men, young men, old and young women work in the shambas. Nearly all are well disposed and friendly to strangers, and this feeling improves the more we see of one another. It is my opinion that if a European could always be travelling through the district and mixing with the people there would never be any trouble. The natives who are in the immediate locality of this station are so well disposed to the European that sooner than lose him they are willing to keep his men in food, and this they have done with a hearty good-will, seemingly only too pleased to be able to show their good feeling to the Company, &c. Every man upon becoming old and feeble is called an Mzee, and as such has a sort of right to sit at General Meetings of Wazee, but at the head of each district there are certain Wazee who are recognised as head Wazee, and who are the principal spokesmen for that district. One of the privileges of old age is with old men a perfect right to be continually drunk. Nearly all the men and many of the old women are inveterate snuff takers, tobacco being largely grown here for the purpose of making snuff, as is sugar cane for the purpose of making tembo.

DRESS.—The young man who professes to be anything at all wears a narrow piece of well-greased cloth flung over one shoulder ; he has several coils of brass wire on his arms and legs, thin brass chain round his forehead and through his ears, a small round looking-glass fastened to the chain on his forehead, another suspended from his neck, and a twisted brass wire round his stomach ; these several adornments added to an Mkamba sword in one hand and a bow and some poisoned arrows in the other, the body being well covered with a mixture of ghee and red earth,

make up the Mkamba dandy in full dress. The ladies generally have between thirty and forty strings of pink beads round their neck, brass chain through their ears, and a few strings of beads round their head, one or two brass armlets and brass wire on the legs, a flat brass apron (made out of brass wire worked into beads threaded on leather), about 1 ft. wide by 15 in. deep, and weighing from 5 lb. to 8 lb.; extending from the back and fastened to the waist-cord is a tail-like arrangement made out of goat skin, and over her shoulder and hanging down her back covering one side is a tanned goat skin; in many instances cloth is substituted for the skin, and the demand for cloth increases daily. Some of the people are good blacksmiths and brass-workers. A man's riches here consist of cattle, and all their marriages and disputes are settled by the giving and taking of cattle. The people generally form settlements by collecting together in quarters with a Wazee. All shambas are seemingly the common property of these settlements. They have no religion of any kind; no gods are worshipped; yet they have a sort of an idea of a hereafter, but only for certain people and for certain reasons. When dead only the chief Wazee and women are buried, the bodies of children and men are thrown away on some vacant piece of land, and short work is made of them by the hyenas.

DISTRICTS.—Ukambani consists of several different districts, which will be seen by referring to the sketch map. There appears to be a good understanding between them all except Kilungu; the Kilungu make themselves by their acts to their neighbours a common enemy and nuisance. In the old days, before the Company established itself in Ukambani, Kilungu (which is one of the largest and most powerful districts of Ukambani) used to be continually at war with the remainder of the country, with the consequence that now they have not a single friend, and the general peace between the people is kept by the European, much to the gratification of the decent and greater part of the population. All the various districts are thickly populated, and as regards resources on the average under corresponding favourable circumstances, they are very similar to one another. There is a large tract of country to the east and north-east of Mala inhabited by Wakamba, but of these people I know nothing, except that at times they raid into Mala; I believe they are agriculturists like these Wakamba, and are exceedingly rich in cattle. Kikumbuhiu (Kibwezi, &c.) I have not included in this report, for the reason that I have had no opportunity of visiting the country.

SEASONS AND CLIMATE.—The small rains commence here in November and continue to about the end of December; the big rains commence about the end of January and end about the beginning of April. *The climate, in my opinion, is a splendid one. It is such, I feel certain, that any European would enjoy all the year round; manual labour for Europeans is at all times of the day and every day an easy matter.*

TEMPERATURE.—*The mean average temperature is about 68° Fahr.*

THE MASAI, &c.—During the dry season the Wakamba and Masai are generally engaged raiding one another, and it is in my opinion an open question as to who eventually gets the best of it; I think that before the wet season comes, as regards cattle, etc., both parties are about square. In nearly every instance the Masai are the first aggressors; their hand is, as a rule, against every man, and they live by raiding cattle. When I speak of protection to the Wakamba against the Masai, I mean more than that this raiding system in general should be stopped; what is required is to prevent the Masai from raiding in, when, if this is done, the Wakamba will, if requested, desist from their raids outwards; the raiding of Masai by Wakamba are mostly retaliatory raids.

GAME.—The vast plains to the north, south and west of Ukambani are overrun

with a great variety of game; within three to five hours of this station excellent shooting is to be had, such game as the rhino, zebra, wildebeest, and various kinds of antelope, lions and various small game, and a few giraffe, and at the River Athi quantities of hippo.

TRADE GOODS REQUIRED FOR THE DISTRICT.—The following are the most useful articles for barter in Ukambani: Pink pound beads, medium size blue kiketi beads, brass wire, both thick and medium; gumpty (grey cloth), small round mirrors with gilt frames; very few fancy or coloured cloths required. Cloth is bought and sold by the "hand" (that is, measured from the tip of the longest finger to the tip of the elbow); beads are sold by the string, and about twenty-five strings of pound beads go to the pound, and about fourteen strings of kiketi to the pound. Brass wire is bought and sold by the ring, and $2\frac{1}{2}$ rings to the pound.

In conclusion I have only once more to say that Ukambani without quick and cheap transport to the coast can never be a source of revenue to the Company; but I think that this also is the case with all the country in the interior.

Machakos as a station has proved its use to caravans, and as an interior base for transport operations as at present worked I am of opinion that it is invaluable.

(Signed) JOHN AINSWORTH,

Commanding Machakos.

P.S. Sketch Maps, parts 1 and 2 enclosed herewith. (Signed) J. A.

Machakos Station, June 30, 1893.

To the Administrator, Mombasa.

SIR,—I have the honour herewith to submit to you my general report for this district for the six months ending June 30, 1893. In my general report sent in last December I gave you a brief outline of the various features and resources of Ukambani, and if in this half year's report I should again include matter previously mentioned it is in order to further strengthen my previous assertions.

RESOURCES.—*The more I see and understand the food resources and the more I consider the vast possibilities of this vast country, the more I am convinced that with cheap and quick transport to the coast there is a great future in store for this part of Africa.* From March, 1892, to March, 1893, I find we had purchased in the station, for the use of caravans *en route*, 100 tons of flour and grain; this is entirely independent of food purchased by caravans for consumption while here, and entirely independent of supplies to the garrison, which, together, must have amounted to quite another 100 tons, making a total of 200 tons; this supply has come from only a limited area, the greatest distance not being more than three hours from the station, and has been supplied without any special effort.

About four or five times this quantity could have been bought here, all from the same area, had we required it, which would amount to, say, 1,000 tons. In this district alone, from Nzawi to Machakos, and from Maka to Mala, there are five other such areas (not counting Nzawi) which could have produced as much supposing there had been the demand as in this area, making, say, a total of 5,000 tons. And still there are hundreds of thousands of acres waiting to do their share of producing, and thousands of willing hands ready to till and sow, if this demand should arise.

If a railway existed, goods for barter could probably be brought up here for about £5 a ton, or, say, 3s. a load, and if such were the case grain could be purchased here at about one-eighth of a penny per pound, possibly cheaper. Then, by that time, a great demand would have been created, and the supplies would easily have come up to 20,000 tons yearly, which would require transit to the coast. If the railway charged £2 a ton for such produce, that would amount to about

eleven-twelfths of a farthing per pound, or an income to the railway of £40,000 per annum, and this only bringing up the cost of the grain on reaching the sea-board to one farthing and five-twelfths per pound, plus a very small percentage for buying, &c.

I have seen it stated that the African will not produce grain, &c., in any quantity except for his own use; but such assertions do not at all tally with my experiences here. In fact, but once create the demand, and let these people see that such demands are going to continue and increase, and the production will follow. Even now they have very much more grain than they themselves can consume, and the only reason for such extra production is that they have prepared for the demands of our caravans. And now all their last year's shambas and others are once more full of grain.

This is only dealing with grain, &c. *There is, independent of this, a large cattle trade to be done in the country, and this only needs quick transport to be made a paying business.*

Then, again, there is another source from which to expect production in the future railway age, *i. e.*, European settlers planting the outlying districts. *There is no saying what European enterprise could develop here. It only wants the enterprise and necessary capital; labour is cheap and in abundance, and the country itself is more than promising.*

APPROXIMATE AREA AND POPULATION.—Higher Ukambani, or what you commonly know as the Machakos district, is situate within longitude 37° and 38° east of Greenwich, and 1° and 2° latitude south. It contains about 1,200 square miles with a population roughly estimated at half a million.

The whole of the country inhabited by Wakamba and called Ukambani comprises a very much larger area; roughly, I should estimate it at between 7,000 and 8,000 square miles, with a population of about 1,000,000. This country extends from Kikumbuli by the Tzavo river to the Athi plains on the north and north-west. On the north-east it extends to the Tana river, on the east it extends beyond the Athi river, and on the south and south-west it extends to the Kapti plains. In my estimate of 8,000 square miles there are large tracts of land unoccupied, so the average of population to the square mile seems rather sparse, but in some of the inhabited parts the population reaches an average of about 500 to the square mile.

Besides this there are vast plains lying adjacent to the country, and which are easy of access from the south, the south-west, west, north-west, north, and north-east. I should estimate their area at about 1,250,000 acres, nearly all inhabited, mostly all of this with a good water supply, and with a little energy devoted to damming water courses, the whole could be watered, and this area could be extended to an enormous extent; *millions of acres of grazing and agricultural land are lying waiting an opportunity to be of service to man.*

THE NATIVES AND THE COMPANY.—The Wakamba are an increasing people, and according to all their traditions they have steadily been assuming as far as population is concerned a leading position in this part of Africa; but they are not what is commonly known as a powerful people, in consequence of the fact that they are so split up into various districts having no unity. What they have been in want of is a general head, which head should be in a position to wield authority over the whole, and which should be able to effect the general internal peace of the country. Such a head they are finding, and in many instances have found in the Company. Faction fights, which were once common, are now unknown; matters that would previously have been fought out are now brought to us for adjustment. In many instances where trouble has been brewing a word from the station has brought about a peaceful meeting instead, and we have brought elders together who

never were on speaking terms before. Thus the Company is assuming the position of head of the people, and this is as the majority of the Wakamba themselves wish.

If the Company leaves them at this stage all this that we have effected will be lost ; if the Company remains we shall have the satisfaction of seeing the Wakamba become a strong united people, useful members of society, and full of good feeling to the Europeans. *And if ever a railway should connect it with the coast, the country will become a source of supply to the civilised world and of revenue to its benefactors.* Our work here is just beginning to bear fruit ; after many efforts we have at last got the young men to take up various kinds of work, and now labour is plentiful.

They are entering very willingly into the work of carrying loads. *Hundreds of sturdy fellows are ready to go down to either Tzavo or Teita and bring up loads to this point, and if required take them on to Kikuyu ; they do their journeys much quicker than coast porters, and the chances of loss of loads by them by desertion is nil.* The other day I sent a caravan of Wakamba to Tzavo for loads, and they did the down and up journey—a distance of about 300 miles—in seventeen days delivering their loads intact.

The difficulty of obtaining native labour is now a thing of the past. I have only to send word that I want labourers and *the young men swarm in to take up the work.* Their work is on the average better than that of the coast men ; they are much smarter, and more to be depended upon ; they are cheaper and there are thousands of them, and, of course, they require their payment in barter goods ; they engage to work by the week or month ; payment to be received when the time has finished. When they write down (engage) I give them paper tickets which they call “Laka” (I give the same sort of thing to carriers, &c.), and as long as the native has his “Laka” he is perfectly satisfied to work on, day by day, until his week or month has finished.

To the station this change is of great benefit. Formerly Swahilis were required to do all the work (sometimes we got native women to come in and cut and clean grass, &c.), and consequently a large staff of local labourers had to be always kept here, and that whether there was work or not. Now we can reduce or increase our staff as required at a moment's notice.

Many of the young men are very keen to be enrolled as Askari (police), and what few I have here in that capacity are very apt and understand very well indeed the rudimentary drill which they are taught. If required, a very substantial force could be raised here ; and one thing further about these people is that once they write down, for whatever work, I have found them perfectly trustworthy.

The following in connection with the people here may interest you. On Sunday we of course cease labour, and all the people in the vicinity know this. Since we have started native labour it is a common thing on Sundays to see our labourers promenading in and about the station decked out in their last pay.

Considering all this, and considering that the Wazee have since last November contributed over 12,000 lbs. of grain to the garrison here, and the Wazee's willingness to at all times assist us in every possible manner—considering all this I think we have, with proper management, a bright future for Ukambani.

And there is one thing I sincerely hope, and that is that these people—now that they are beginning to understand and appreciate what the Company has done and is doing for them, and now that they are showing in a substantial manner their appreciation—will not be left to think that all this was but an idle dream.

Such is what I have to say of Ukambani and the Wakamba in this my latest report, and personally *I am longing for the day, which I feel sure must come, when European enterprise will show the world that this is indeed a land flowing with milk and honey.*

What enterprise in the world, courting success, needs more than what we have to our hand here? We have a fine country, capable of every result as regards agriculture, etc., we have a friendly people, willing and industrious and ready to earn their wage as labourers, and we have a climate which I claim to be second to none in the world—what can man want more? You may say there is wanted a better and easier means of reaching such a land, etc. I grant you that. If such a land as this had been within a few miles of the coast, or of easy access, I am inclined to think that to-day it would be the valuable appendage of some other European Power and would have been in that position long before this generation saw the light of day.

For your information I beg to say that *cauliflowers* weighing three to four pounds each, *fine solid cabbages*, *fine crisp lettuces*, *large solid bulb onions*, *excellent beetroot*, *green peas*, *kidney beans*, *tomatoes*, *turnips*, *radishes*, *parsley*, etc., in as fine condition as anyone could wish to have them in Europe, are produced daily from the gardens here, and in this matter I have especially to mention the very excellent seeds supplied by Messrs. Sutton and Sons, of Reading.

SLAVE TRADE IN UKAMBANI, PAST AND PRESENT.—In Ukambani before the Company's days, the slave trade used to be considerable; at present in comparison it is insignificant. It appears that where this station now stands used to be an old Arab and Swahili camp where slave dealing was briskly carried on. At a place called Quamboli, also, such a camp existed, and still exists, but being close to the station it is always strictly watched while occupied by trading caravans. There are also camps at Mala and Nzawi of which I have very grave suspicions; in fact I am certain that at times slaves are bought and sold at both these camps, but being some distance from this station and on account of the very small force here, and my being single handed, etc., I am unable to do at those places what we have done here; on occasions when I take a trip to these localities it is impossible, during the short time I am there, to learn anything on which I can act.

The only effective way to put a stop to this trade as far as Ukambani is concerned is to establish posts at Mala and Nzawi with an European continually travelling between the two; this would not only have the effect of stopping all possible local slave trade, but also it would be able to intercept caravans which pass through Mala on their way to the coast from Kikuyu and districts beyond, all of which caravans I am certain have slaves.

Here in Ukambani the people bought and sold are not Wakamba but Wakikuyu and Masai captives.

Many of the Wakamba, of course, know that such trading is illegal and forbidden by the European, and in the vicinity of the station I feel certain that no such trade exists; but in such places as Mala and Nzawi, which are being continually visited by Swahilis, &c., it is somewhat, in fact it is very difficult to keep the natives, as regards this question, in touch with us, and under present arrangements and circumstances it is almost impossible to find out satisfactory and conclusive evidence in these matters. The Swahili comes to these places ostensibly to buy cattle, goats, and donkeys. Of course I don't deny that a large trade is done in these articles, but they are also very willing to buy a good-looking young woman, an able-bodied man, or a child.

The natives in the vicinity of this station know and respect the European's view of this trade. I have also tried to impress the natives who are further afield with the same ideas; but for reasons which I have stated, and that the trade results in profit to them, it is very difficult under present circumstances to cope with the matter effectively; otherwise I find the majority of them perfectly tractable to all my other wishes, one reason for this being that there are no other influences at work against

those wishes ; but in this slaving matter, until we are resident in these outlying districts, the Swahilis will always have the predominant influence.

By all means allow the Swahilis to come up into the country to buy cattle, but make it so that they must encamp at certain centres where we are established. As it is, the majority take good care to encamp as far away as possible from the station, and then in most out-of-the-way places. Quamboli camp, on account of my persistent action there, is now very seldom occupied.

If Mala and Nzawi are occupied, I am confident that in a very short time any trade in slaves will entirely cease, and coastward caravans from the further interior will have much greater difficulty in passing down.

And if stations were established at Kibwezi and Munoni (both in further Ukambani) slave caravans from the further interior would find it impossible to pass down to the coast without adopting more difficult and more dangerous routes, as at the above-mentioned two places caravans using any routes but the West Kapti must touch to obtain food in Kikuyu, or come to Mala, a place that can be worked both from here or Nzawi.

As far as the Wakamba are concerned, their slave trade has been established amongst them by the Arabs and Swahilis, and if we only adopt the same means in the slave-dealing parts we have adopted here with perfect success, the slave trade in Ukambani will soon be a thing of the past.

(Signed)

JOHN AINSWORTH,

Commanding Machakos.

THE EXTREME HEAT AND COLD ENDURED BY MAN.

(By the MARQUIS DE NADAILLAC, Paris, France.)

The exceptional faculties of Man enable him, alone of all the mammals, to battle with extreme cold as with extreme heat, and it is with real astonishment that we ascertain what men of our race can endure. In the earliest times of which we have any knowledge, we have strong evidence that our species lived, both in America and in Europe, when large extents of both continents were covered with ice and when his companions were the elephant and the woolly rhinoceros. Later, the Aryan race, whatever may have been its birthplace, reached step by step in the south the Gangetic Peninsular, 8° only removed from the equator, and, in the north, Iceland and Greenland, which seem the extreme points attained by our most prolific race in those days so distant from ours.

A few years ago the English and Russian officials assembled at Maruchak for the delimitation of Afghanistan suffered a mean temperature of — 20° C., which was considered moderate in those regions. In his eventful journey across the mountains of Central Asia, utterly unknown to us, Prince Henry of Orleans had to support a cold of — 40° C. (mercury is congealed at — 29° C. ; alcohol alone, highly rectified, can mark the low temperatures we give here), with piercing northern winds. The horses and camels died ; man resisted.

The northern parts of America have known still more severe colds. Captain Black reported at Fort Reliance — 56.74° C., and Captain Dawson, at Fort Rae, in 62° 30' north latitude, — 67° C., in April, 1882. Other explorers have never observed such low temperature. The Abbe Petitot gives us — 40° C., as the mean temperature of January at Fort Good Hope, and — 35° C. for January, and — 42° C. for February, at Yukon, Alaska.

In Siberia we find the coldest points inhabited by comparatively civilized men. In the government of Yenissei, the winter time is double the summer time. Autumn sets in in August, and the Yenissei River is completely frozen by the month of October. Yakoutsck was long considered the coldest town of the world. During the winter months the thermometer is as low as -45° C. But Yakoutsck must yield to Verkhoyansk, a small Siberian town at the mouth of the Lena, where we find -55° C. in January. And yet this cold is far from being the most severe suffered in those dreary regions. A Freuchman, Mr. Martin, recently dead, travelling in Eastern Siberia, wrote to the Society of Geography, of Paris, that he experienced in 59° north latitude and 132° east longitude a cold of -63° C.

Physical phenomena, the differences in the relation of the continents and the oceans, have a greater importance than was suspected some years ago. Yakoutsck, which I have just mentioned, is only 6° nearer the Pole than Edinburgh, and numerous arctic islands are on the same latitude. Yet Edinburgh and these islands enjoy a much warmer climate, thanks to the Gulf Stream, so well studied by Lieutenant Maury, one of the glorious scientists of our day.

This is probably the cause that some of the polar lands do not always experience the extreme cold we find in some parts of Siberia. Captain Nares' careful observations in Grinnell Land, in 1875-6, only give for January -36° C., for February -38° C., for March -39.90° C., for November -27.12° C., for December -36.6° C. Nordenskjöld, in one of his latest voyages, speaks of -47.7° C. We have still higher records. Lieutenant Greely, in his ill-fated expedition, tells us that during his long stay at Discovery Bay the temperature maxima never exceeded $+50^{\circ}$ (Fahrenheit) and was at one time as low as -66° F. This difference of temperature, supported in a few months time by the same men, is most remarkable. Hunger, dearth of provisions, incredible hardships broke down those who had so bravely suffered extreme cold.

Nothing daunted by the cruel fate of Lieutenant Greely's companions, Lieutenant Peary tried, in his turn, to attain the solution of the northern problem, and, with a courage which does infinite honour to her sex, Mrs. Peary elected to accompany her husband. They wintered, in 1891, in MacCormick Bay, about a hundred miles distant from the great Humboldt Iceberg, and lived for three months under a temperature varying from -30° C. to -50° C. without experiencing any very great inconvenience.

In one of the last polar expeditions attempted by the English, in the month of November, the thermometer marked -60° C., and on the 25th of January it went down to -63° C. on board the "Varna" and the "Dymphna," blockaded in the ice.

But probably the highest amount of cold ever suffered by white man is the one recorded by Mr. Gilder, a reporter of the *New York Herald*, attached to the expedition which, under command of Lieutenant Schwatka, went in search of Franklin. In the letters sent home during the winter of 1879-80, so severe in all parts of the world,* he speaks of the thermometer lower than -71° C. Here again we find men of our race supporting an almost incredible amount of cold from November, 1879, to March, 1880. Their power of endurance may be attributed to their stay at Camp Daly from August, 1878, to March, 1879. They experienced there a range of temperature from $+14^{\circ}$ C. to -51° C. The members of the expedition had adopted the way of living of the Innuits. Like them, they fed on the raw flesh of the seals and the walrus and absorbed large quantities of oily and fatty matters which prevented

* As a comparison, I give the lowest temperature experienced in Paris during the last century: January, 20, 1788, -21.5° C.; January 25, 1795, -23.5° C.; December 9, 1871, -21.3° C.; December 10, 1879, -23.9° C.

the spread of scorbutic diseases, so fatal to many of their predecessors. The tents were rapidly discarded and replaced by *iglous*, the native winter houses of hard frozen ice, which, curiously enough, retain a considerable amount of heat. Their clothes were made of reindeer skin without any linen underclothing, so as not to put a stop to perspiration.

I hope to compile the highest amount of heat supported by men of the white race. I will only mention here that in Algeria, by no means the hottest point of the globe, our soldiers have often seen the thermometer as high as $+51^{\circ}$ C., and Mr. Buveyrier, in his travels amongst the Touaregs, noted $+67.7^{\circ}$ C. If we compare the extreme heat (and we will certainly find higher points) the difference between -71° C., recorded in the Schwatka expedition, and $+67.7^{\circ}$ C. reaches nearly 138° C., and testifies, as I said in the beginning, to the remarkable power of endurance of the white race.

THE MELANESIAN PLATEAU.

Read to the Society Wednesday, October 18, 1893.

Mr. J. P. Thomson, F.R.S.G.S., etc., of Brisbane, contributes the following notes: In a paper contributed to the Linnean Society of New South Wales,* Mr. Charles Hedley, F.L.S., of the Australian Museum, introduces to the world of knowledge an interesting and geographical subject regarding the early continental character of what are now insulated areas extending over a rather wide range of the South Pacific Ocean. This extensive plateau embraces within its geographic limits the archipelagoes now known as the New Hebrides, Fiji, Solomon, Loyalty, New Zealand, and the islands of New Caledonia, Norfolk, and Lord Howe. The assumption that these are fragments of a disintegrated continent, now connected only by comparatively shallow and submerged depressions of probably great antiquity, is based upon the geographical distribution of the land molluscan fauna, more particularly upon the genus *Placostylus*. Representatives of this class are distributed over an area bounded on the north by the Solomons, on the east by Fiji, on the south by New Zealand, and on the west by Lord Howe Island. This, it will be noted, lies within the volcanic sub-region extending from the Solomon Islands through the New Hebrides to New Zealand, and embracing the comparatively shallow tongues stretching to New Caledonia, Fiji, and Lord Howe Island. It is this area, probably bounded by the 1300 fathom contour-line that Mr. Hedley proposes to name the Melanesian Plateau. Although no allusion is made to the broad geographical conditions far and away outside this circumscribed region, it should be pointed out that it is to no inconsiderable extent within the influence of that enormous belt of subterranean activity extending right across the Pacific from the South American continent through the Eastern Archipelago and Sunda Islands to Madagascar, embracing amongst others the Marshall, Caroline, Gilbert, and Low Groups, as well as Samoa and Tonga. These, in the writer's opinion, should also be connected with Mr. Hedley's newly-evolved plateau. We are, however, told that "eastwards of Fiji the molluscan fauna indicates the abrupt termination of the Melanesian Plateau. Between the Samoas and Fijis a sounding of 2,600 fathoms has been obtained. Significant of this is the absence of *Placostylus* from Savaii, Upolu, or Tutuila. The Samoan Islands appear as well fitted as the

* "The Range of *Placostylus*: A Study in Ancient Geography," by C. Hedley, F.L.S., Vol. VII. (second series) of the Proceedings of the Linnean Society of New South Wales, August 31st, 1892, page 335.

Fijian to nourish an extensive series of *Placostylus*. They are large, densely wooded, with a warm, moist, and equable climate. The distance from their western neighbours is no greater than from the latter to the groups to the westward, and not to be compared to the spaces between New Caledonia and Lord Howe or New Zealand, which have proved no obstacle to the spread of the genus. Yet the Samoa possess a distinctly oceanic mollusc fauna comparable to that of Tahiti, while the mollusc fauna of the Fijis is as distinctly continental. On the westward, we learn from the Challenger soundings that about the 20th parallel a bank of a maximum depth of 1,300 fathoms connects the Melanesian Plateau with the Great Barrier Reef. This bank was not actually plumbed, but its existence is inferred from the fact that soundings in the Coral Sea diminished in temperature down to 1,300 fathoms, and below that level to 2,450 fathoms the thermometer readings were stationary. The inrush of cold water from the Antarctic abyss is therefore stopped by banks, whose lowest depth is 1,300 fathoms, hemming in the abyss of the Coral Sea. But the canal whose floor is the 1,300 fathom level *may* lie, not between the Great Barrier Reef and New Caledonia, but at the head of the gulf between the Loyalties and the New Hebrides." The probability of an early connection between the Australian continent and New Zealand, and therefore north to New Guinea, is a subject upon which several enlightened writers have dwelt. The affinity between the flora of these separate regions is not, however, in the writer's opinion sufficient evidence of their former continental character. It is well known how the germs of plant life have been disseminated over vast oceanic and insular regions through the medium of the great circulating currents of the ocean. Geologists on the other hand have more reasonable and adequate evidence to adduce in support of this theory than we are able to find in the distribution of plants. Professor James Geikie, in an exhaustive and very valuable paper upon the "Evolution of Climate,"* points out that there is "every probability that at some later stage of the Mesozoic era a land connection obtained between New Zealand and Australia;" thus supporting the well-known naturalist Wallace, who claims to have shown that this union is sufficient to account for the predominating features of the New Zealand flora. But here, again, we are opposed by Mr. Hedley, who contends that "this theory is totally opposed to the distribution of *Placostylus* in particular, and of the Melanesian mollusc fauna in general. Were it true, then Lord Howe, the furthest western outpost of the Melanesian Plateau, would be tenanted by forms bearing some resemblance to Queensland mollusca. Had the stream of life reached Lord Howe from the north-west instead of from the north-east, then *Placostylus* would have been replaced by *Hadra* and *Chloritis*, while *Pupina* and *Helicina* would have been substituted for *Realia* and *Omphalotropis*." Assuming that the actual geographical limits of this plateau are substantially defined and circumscribed by the range of this genus *Placostylus*, we shall certainly require to cast about for some new theory that will adequately account for the presence of the remains of the New Zealand Moa in Queensland, bones of that remarkable wingless bird having been discovered on the Darling Downs, and identified and described by Mr. C. W. de Vis, Curator of the Queensland Museum.† The Post Pliocene Drifts of Queensland have also yielded fragments of the remains of the Kiwi, *Metapteryx bifrons*, an extinct bird belonging to the family *Apterygidae*, of New Zealand.‡ Here we are at once furnished with types of the avifauna of a bygone age, when continents,

* "Scottish Geographical Magazine," vol. vii., p. 77.

† "The Moa in Australia," by C. W. De Vis, M.A., "The New Zealand Journal of Science," May, 1891, No. 3, Vol. I. (new issue), p. 97.

‡ "Residue of Extinct Birds of Queensland as yet Detected," by C. W. De Vis, M.A., Proceedings of the Linnean Society of New South Wales, second series, Vol. VI., p. 448.

probably existing under different climatic conditions to those which belong to the present period, possessed all the necessary requirements essential to the sustenance of a variety of both animal and vegetable life, of which the few interesting specimens we possess are but mere fragments. Thus we see the process of unconquerable nature going on from age to age, always active, ever silently shaping things new from an inexhaustible stock of indestructible material; new continents are evolved and so are new worlds, and this will forever continue. Of the islands occupied by *Placostylus*, Mr. Hedley thinks they may probably have been united, if not into one continuous whole, at least into much larger fragments with an existing union, probably temporary in character, that would enable this type of molluscan fauna to migrate from one area to another. Should further and more extended examination show that this Melanesian Plateau is insulated by deeper gulfs than those separating it from Australia, even then, Mr. Hedley ventures to assert, the theory advanced in favour of their former union would not suffer defeat. It is the ocean's permanency, not the depth, which he believes will determine the limit of the distribution of forms of life. After referring to the division of the genus *Placostylus* and the difference between its northern and southern types; to the depths of the ocean between New Zealand and Fiji, New Caledonia and the New Hebrides, Mr. Hedley concludes that early in the history of the existing fauna the Melanesian Plateau was insulated, and has never since been united. He, moreover, reviews the evidence of affinity existing between the various forms of land mollusca distributed over the archipelagoes of this plateau, and points out that this unmistakably shows that Fiji first derived its molluscan fauna from the Solomon Islands; that *Placostylus*, having limited its range to the zoological province of the Melanesian Plateau, other groups of islands to the eastward and scattered over the South-east Pacific were colonised by other minute forms of molluscan life that drifted eastwards from place to place. Furthermore, he remarks that this provincial plateau derived its fauna from Papua by the way of New Britain and not from Australia, with which it never was connected; that New Guinea was the source of the genera common to Australia and New Zealand; that after their early separation New Zealand and New Caledonia ceased to receive immigrants from the Northern archipelagoes; and that Fiji "remained to a later date in communication with the Solomon Islands, but were severed from that group before the latter had acquired from Papua much of its present fauna."

The 271st Meeting of the Society held in the hall of the Manchester Athenæum, Friday, October 27th, 1893, at 7-30 p.m. Mr. MARK STIRRUP, F.G.S. in the chair.

The Right Honourable Lord LAMINGTON addressed the members on "Siam and Tonquin." The address was illustrated with lantern views and large maps lent by the Royal Geographical Society.

Numerous questions were asked and great interest was manifested in a collection of cloths, silver work and curiosities, exhibited by Lord Lamington.

A very hearty vote of thanks was passed to Lord Lamington for his address and for the information given in reply to questions.

The 272nd Meeting of the Society, held in the Athenæum, on Tuesday, November 7th, 1893, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

The Right Honourable the Earl of DUNMORE addressed the members on his "Journey from Rawal Pindi through the Pamirs to the Caspian." The address was illustrated with lantern slides made from photographs and sketches, and a large map lent by the Royal Geographical Society.

Questions having been asked and replied to, a vote of thanks was heartily passed to Lord Dunmore, Alderman Leech (Manchester), Alderman Bowes (Salford), Professor W. Boyd Dawkins (Owens College) and the Very Rev. Dr. Casartelli (St. Bede's College) spoke on the motion.

The 273rd Meeting of the Society, held in the Memorial Hall, Friday, November 17th, 1893, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

Mr. WILLIAM THOMSON, F.R.S.E., F.C.S., addressed the members on "A Recent Visit to Mexico." The address was illustrated with a large number of lantern views from photographs taken by Mr. Thomson, and a very interesting collection of curiosities brought home by him.

Questions were asked, and a hearty vote of thanks was passed to Mr. Thomson for his interesting and valuable address.

The 274th Meeting of the Society, held in the Library, Friday, November 24th, 1893, at 7 o'clock. The Rev. S. A. STEINTHAL in the chair.

The minutes of meetings held July 1st (256), 5th (257), 12th (258), 22nd (259), August 5th (260), 9th (261), 18th (262), 26th (263), September 2nd (264), 9th (265), 30th (266), October 7th (267), 11th (268), 18th (269), 18th (270), 27th (271), Nov. 7th (272), 17th (273), were read and approved.

Presentations to the Library were announced, and notice was given that the Council had elected the following members:—

ORDINARY—Miss Crowther, Mrs. W. Boyd Dawkins, Mrs. Oram, Miss Ward, Miss Wood, Messrs H. L. Berthoud, C. H. Bellamy, Louis R. Bubier, Thomas Camm, William Davies, Thomas Howard Drew, J. D. Fairley, Isaac Forth, James E. Gower, John Green, E. A. Gregory, Thomas Hassall, E. G. W. Hewlett, B.A., Percy Heywood, Rev. William Hill, John Holdsworth, Adam Laidlaw, A. Leech, Professor D. J. Leech, M.D., George Mason, Louis P. Nott, Alec Reiss, J. A. Reiss, Dr. James Richmond, M.A., Rev. R. H. Riley, M.A., Thomas Riley, Egbert Steintal, Edward Sutton, L. E. North Szigetváry, Charles Henry Thompson, F. Tomlinson, and J. F. Tristram B.A.

ASSOCIATE—Miss Lily B. Bowes, Miss Elizabeth Crowther, Mrs. James Richmond, Messrs. Walter Cheetham, Sydney Higham, Thomas Scott, J. H. Simpson, and John Stewart, jun.

Mr. Theodore Gregory, F.C.A., and Mr. William Aldred, F.C.A., were thanked for their past services as honorary auditors, and were re-elected on the motion of Mr. J. D. WILKE, seconded by Mr. T. DENTITH, and supported by Mr. W. HAMER.

Mr. THOMAS DENTITH addressed the members on "Matabeleland and Mashonaland." The address, which was illustrated with a number of maps, was closely followed, and gave rise to considerable discussion.

Mr. WILLIAM HAMER read a paper on a "Journey in Wensleydale." Conversation ensued on this very interesting description.

Communications and correspondence were read, and votes of thanks passed to Mr. Dentith and Mr. Hamer.

WENSLEYDALE.

By Mr. WILLIAM HAMER.

In North-West Yorkshire are three charmingly picturesque vales, severally twenty to twenty-five miles in length, and running roughly parallel with each other, viz., Wensleydale, through which the River Ure flows; Swaledale, watered by the Swale; and Teesdale, the course of the Tees, the last named dale forming the northern boundary of Yorkshire and the southern boundary of county Durham. These dales are separated by lofty moors or fells. On our first visit we took a somewhat circuitous route, viz., to Harrogate, thence by rail along the valley of the Nidd to the nearest railway station to the celebrated Brimham Rocks, well worth the seeing, thence on foot to the magnificent ruins of Fountains Abbey, and through the beautiful Studley Royal Park to Ripon, where, of course, the ancient cathedral was duly inspected and admired. Thence on foot through Masham to Leyburn, near the foot of Wensleydale. From Manchester the most expeditious route is by the Midland Railway to Hawes Junction, whence the traveller can either commence his walk or go by rail to any part of the dale he desires. We, on our second visit, left the train at the Junction, and had a pleasant walk of six miles to Hawes, a place of some importance in the mining industry.

About a mile distant from this town is the famous Hardraw Force, the River Ure taking a clear leap of 99ft.

Down, down, precipitous and rude,
The rocks abruptly go,
While through their deep and narrow gorge
Foams on the brook below.

In 1740 and 1880 this fall is said to have become an enormous crystal tube of ice, through which could be seen the running stream. Four miles down the vale brings us to Bainbridge, the Roman station *Bracchium*. Here is a small lake, Seamer Water, of legendary miraculous origin. The legend runs that, in Apostolic days, a city stood on the site. A poor old wayfaring man vainly begged from door to door for food and shelter, until the occupants of a humble cot *without* the city had compassion upon him. On his departure next morning he gave his blessing to his hosts, but turning towards the city said—

Seamer Water rise, Seamer Water sink,
And swallow all the town,
Save this little house,
Where they gave me meat and drink.

Amid the roar of an earthquake and the rushing of water, down sank the town, and the smooth water covered it all save the hut wherein he had found a refuge. The next place is Askrigg, near which is Millgill Force, which has a fall of 69ft. Lower down the dale is Aygarth. Here is a beautiful waterfall, surrounded by lovely and romantic scenery. The church contains the screen from Jervaulx Abbey, and is so finely situated as to recall the poet's lines—

How beautiful they stand,
Those ancient churches of our native land
Amidst the pasture fields and dark green woods,
Amid the mountain clouds and solitudes;
By rivers broad, that rush into the sea;
By little brooks, that with a lisping sound
Like playful children, run by copse and lea:
Each in its little plot of holy ground
Those old grey churches of our native land.

Aysgarth possesses an excellent hotel, has also private apartments, and is a capital centre for those who desire a settled abode while exploring the beauties of this and lateral dales. Near Aysgarth are the ruins of Bolton Castle, a fine feudal stronghold of the Scropes, built in the reign of Richard II., and around which a halo of romance is thrown by its having been for a few months the prison of the hapless Mary, Queen of Scots. Long before this the castle was famous. Here Lord Scrope marshalled his feudal retainers to join the army which fought on Flodden Field.

Lord Scrope, of Bolton, stern and stout,
On horseback who had not his peer ;
No Englishman Scots more did doubt ;
With him did wend all Wensadale
From Morton unto Moisdale Moor ;
All they that dwelt by the banks of Swale
With him were bent in harness stour.

In the same neighbourhood is Bolton Hall, the residence of Lord Bolton, containing some fine portraits of the Scrope family by Vandyck, and surrounded by extensive woods rivalling in beauty the well-known woods of Bolton Abbey, near Skipton.

As regards Bolton Castle, perhaps I ought to add that during the Civil War it was held for King Charles by Colonel Scrope and Colonel Chaytor, the latter of whom, after being reduced to eat his horses, capitulated November, 1645, and marched to Pontefract. The Committee at York ordered it to be "made untenable" in 1647, and from that date it has been falling into decay.

Nappa Hall, which can also be visited, is the ancient seat of the great clan of the Metcalfes. In 1556 Sir Christopher Metcalfe, as sheriff, met the judges at York with 300 of his own name and kindred. Of the same family was Lord Metcalfe, the governor successively of Jamaica, Canada, and India. The hall is said to have been built by Thomas Metcalfe, Chancellor of the Duchy of Lancaster in the reign of Richard III. Tradition says it was frequently visited by Mary, Queen of Scots, and it contains a bedstead in which she slept, a pair of her gloves, and an autograph letter from her to a Metcalfe. Her son James I. was also entertained here.

The next object of interest is the village of Wensley, from which the dale obtains its name. Its church contains some relics from Easby Abbey, near Richmond, Yorkshire, and the tomb of the father of Mason the poet, who was the rector of Wensley from 1673 to 1693.

Our next move takes us to Leyburn, in itself not particularly interesting, but the neighbourhood is particularly so. In the churchyard is the tomb of the doctor in whose arms died the hero of Trafalgar, Lord Nelson. Near the town is the remarkable terrace walk, known as "Leyburn Shawl," from which a charming prospect is obtainable when the atmosphere is clear. At one point of this terrace Queen Mary is said to have been retaken on her attempted escape from Bolton Castle. It is known to this day as the "Queen's Gap." Within a few miles of Leyburn are the ruins of Middleham Castle, the famous stronghold of Warwick the kingmaker, and which was for years the residence of Richard, Duke of Gloucester, afterwards Richard III. This castle is partially the scene of Bulwer's celebrated romance, "The Last of the Barons."

The beautiful ruins of Jervaulx Abbey, an abbot of which is one of the characters in Scot's "Ivanhoe," can also be easily visited. Not far from the ruins is Coverdale, in which was born Miles Coverdale, one of the earliest translators of the Bible. In the same dale are some remains of Coverham Abbey.

From Leyburn a fine moorland walk of ten miles brings us to Richmond, at the foot of Swaledale. This is perhaps the most romantic town in England. On a lofty

rock, washed by the River Swale, stands the noble Norman keep, 100ft. high, of Richmond Castle. In the town is a fine old parish church, beautifully situated. There are also another curious old church and the beautiful tower of Grey Friars' Priory. A charming walk of one mile along the river brings us to Easby Abbey and Church. Near Richmond is the village of Hipswell, the birthplace of Wickcliffe the Reformer. About two miles distant is Aske Hall, the seat of the Earl of Zetland, late Lord Lieutenant of Ireland, and where resided Robert Aske, the leader of the rebellion in the reign of Henry VIII. against the suppression of the monasteries, known as the Pilgrimage of Grace. From the heights above the town splendid prospects of Swaledale and of the Vale of York, including the York Minster, can sometimes be obtained.

A legend says that in a vault beneath Richmond Castle lie King Arthur and

All
The goodliest fellowship of famous knights,
Whereof the world holds record,

sleeping until the time when England's greatest need shall again rouse them to her aid. A man wandering round the hills was led down to this vault by a mysterious guide, who placed in his hands a horn and sword. As he attempted to draw the sword every sleeper stirred, as if awaking. Casting down the weapon he fled in terror pursued by the bitter tones of his strange guide ringing in his ears—

Potter, Potter, Thompson,
If thou had either drawn
That sword or blown that horn,
Thou'd been the luckiest man
That ever was born.

Marske, higher up the vale, was the home of the Hutton family, one of which became the Archbishop of York in 1595, and another in 1747. About ten miles from Richmond is Reeth, which must be reached on foot or by hiring a vehicle, there being no railway in Swaledale. It is the mining capital of the dale. From this place the tourist can proceed further to the stern scenery around Muker, or turn aside to visit Arkengarthdale, and pay a visit to Teesdale. We decided upon the latter, called at Greta Bridge, where "Squeers met Nicholas Nickleby," and visited "Rokeby" close by—the scene of Sir Walter Scott's poem of that name, which was written whilst on a visit to the owner of the estate. Here the Greta rushes along at the foot of lofty limestone rocks, crowned by beautifully wooded slopes. How charmingly the scene is portrayed in the poem—

It seemed some mountain, rent and riven,
A channel for the stream had given,
So high the cliffs of limestone grey
Hung beetling o'er the torrent's way,
Yielding along their rugged base
A flinty footpath's niggard space.

A little farther we pass the remains of Eggleston Abbey, and then on to Barnard Castle, after which the town is named. The castle itself is a splendid specimen of a feudal fortress. Luckily a flower show was being held in the ruins, which were splendidly illuminated at night with fine effect. Immediately opposite the King's Head Inn (where, like Dickens, we took up our quarters) there is a watchmaker's shop with an old-fashioned bow-window, over which is the name "Humphrey." From this Dickens obtained the title of his work, "Master Humphrey's Clock." It

will be remembered that Newman Noggs, when writing to "Nicholas Nickleby," advised him, if he wanted a glass of good ale, to call at the King's Head.

A few miles by rail brings us to Middleton-in-Teesdale, at the station of which vehicles are at hand for conveying us to High Force, where the Tees precipitates itself over a lofty rock of about 100ft. in height. It is well worthy of a visit.

Our return home was *viâ* Tebay Junction. Between Barnard Castle and Tebay is Bowes, the Roman station *Lavatrae*, where can be seen "Dotheboys Hall" from the line. As the railway runs at a high elevation, magnificent views are obtained of the Pennine Range and of the great Westmorland plain. To the artist, the geologist, the botanist, and, perhaps above all, the lover of Nature, North-West Yorkshire, too little known, is strongly commended to his favourable attention.

The 275th Meeting of the Society, held in the Memorial Hall, Wednesday, December 6th, 1893, at 7-30 p.m., the Chevalier Froehlich in the chair.

Mr. R. D. OLDHAM, F.G.S., Superintendent of the Geographical Survey of India, addressed the Society on "The River Valleys of the Himalayas," (see p. 112) illustrating his address with a series of lantern slides, a map of India lent by the Royal Geographical Society, and a map coloured to show the geographical features as far as the survey work had extended.

Mr. J. HOWARD REED, Alderman BOWERS, Mr. J. J. TRISTRAM, Mr. B. I. BELISHA, and others took part in the discussion. Alderman BOWES moved, Mr. REED seconded, and Mr. J. SAMPSON supported a very hearty vote of thanks to Mr. Oldham, who responded.

The 276th Meeting of the Society, held in the Library, Friday, December 15th, 1893, at 7-30 p.m., the Rev. S. A. Steiuthal in the chair.

The minutes of meetings held November 24th (274) December 6th (275) were read and approved.

Presentations to the Library, and the election of the following members were announced :—

ORDINARY—Messrs. Thomas Edwin Ashworth, Krestu N. Boiadjieff, X. Lomax, J. Howard Reed, David Spence, Thomas Walker, Joseph Watson.

HONORARY—Baron Frd. von Mueller, K.C.M.G. (Melbourne).

AFFILIATED—Carlisle Institute, Meltham, Saddleworth United Mutual Improvement Society.

A number of communications and considerable correspondence were read.

Mr. F. J. PAYTON exhibited a large number of photographs of Ports and scenes in the Mediterranean which he had visited.

The SECRETARY read a short paper on the Halls of Speke (see p.p. 164, 165) and Hale, and on Dale Abbey (see p. 178) and its surroundings.

Thanks were given to Mr. Payton and to the Secretary.

The 277th Meeting of the Society, held in the History Theatre, Owens College (by permission of the Principal) Friday, December 29th, 1893, at 7 o'clock.

Mr. J. Howard REED (Hon. Sec. of the Victorians) addressed a meeting of young people on "A Voyage from England to Japan."

There was a good attendance of older children of the members, and the address, which was illustrated with lantern views, was very well received. Thanks were passed to Mr. Reed.

FROM ENGLAND TO JAPAN.

A LECTURE TO YOUNG PEOPLE.

By J. HOWARD REED, HON. SEC. (VICTORIANS.)

ON Friday evening, December 29th, 1893, a new departure in the work of this Society was inaugurated in the form of a geographical lecture to young people. This was undertaken, by request, by Mr. J. Howard Reed, and was given, by permission of the principal in the History Theatre of Owens College. The subject chosen for the address was, "From England to Japan," and consisted largely of personal reminiscences, the whole being well illustrated by a large number of photographic lantern views.

Mr. Reed and his audience started on their imaginary voyage from Portsmouth, taking a passing view of Nelson's flag-ship, the Victory, and deviating slightly, by passing round the Isle of Wight, to look at the Needles.

It was explained to the young people that the Bay of Biscay is so called from the Spanish province of that name which borders the coast of the bay, and is the dwelling-place of the Basque peoples, who speak a peculiar language distinct from the Spanish and every other European tongue, and who are supposed to represent the aboriginal inhabitants of the peninsula.

The prominent headlands of the Spanish and Portuguese coasts, which are usually seen by the voyager, such as Cape Finisterre, Cape Rocca, and Cape St. Vincent, were pointed out on the map in passing, attention being drawn to the fact that Sagres, the dwelling-place of Prince Henry the Navigator, is situated on the last-named headland, which is still crowned by a monastery clearly visible from the deck of the passing vessel. The historic town of Palos, in the same neighbourhood, from whence Columbus started on his great voyage of discovery, as well as Trafalgar Bay, the scene of Nelson's victory and death, were also noted.

Gibraltar being reached, several views of both the town and its great feature, the Rock, 1,440ft. high, were exhibited on the screen. It was explained that the name of the place showed at once the Moorish influence which had existed there in the Middle Ages. In 711 A.D. the Moorish general, Tarif-ebn-Zarqa, led the Saracens into Spain, the Rock being named after the conqueror, Gebel-Tarif (Hill of Tarif), becoming in time corrupted into Gibraltar as we know it. The Moors were driven out by the Spaniards in 1462, Gibraltar later falling into the hands of the British after the siege by Sir George Rooke in 1704. From June, 1779, for more than three years and three months the British forces were besieged by the combined forces of France and Spain, who on every attempt to take the place were repulsed by Sir George Elliot, afterwards Lord Heathfield.

Passing to the African side of the Gibraltar Straits, the lecturer showed several views of Tangiers and the district, and spoke specially of the rugged grandeur of the African shore, where the towering heights seem to be formed of huge mountainous masses of rock which might have been tumbled and hurled into their present positions by the fabulous Titanic giants of old. Well might the ancients, he said, call the rocky headlands at the entrance to the Mediterranean "The Pillars of Hercules."

Mr. Reed at this point reminded his young audience of the obvious meaning of the name Mediterranean, or Midland Sea, it being of course summed up in the two Latin words, *medio* and *terra*. He went on to explain the evidence which pointed to the fact of the Mediterranean having been at one time isolated from the Atlantic by the existence of a land barrier at what is now the Gibraltar Strait, and divided into at

least two separate inland seas or lakes by a second land barrier which existed from the south of Italy to Sicily, and from that island to the African coast at Cape Bon. The present depth of water in the neighbourhood of Gibraltar, he explained, is stated to be from 50 to 200 fathoms only, and between Italy and Cape Bon from 30 to 250 fathoms, while the depth of the Mediterranean at other places reaches from 1,000 to 2,000 fathoms. Were it not for the current which continually flows in from the Atlantic the level of the Mediterranean would fall rapidly, as evaporation very largely exceeds the total rainfall which supplies the tributary rivers. Most of the plants of Algiers are also common in Southern Europe. Fossil remains of elephants, now found only in Africa, and large extinct animals, have been discovered not only in Southern Europe but also in the islands of Sicily and Malta. Monkeys are still found at Gibraltar, which are of the same variety as those found on the African side, although they exist in no other part of Europe.

A number of views were shown of Malta, the name of which island, Mr. Reed explained, was said to be of Phœnician origin, meaning "A Place of Refuge." The lecturer spoke in glowing terms of the fairy-like appearance of the island when viewed from the sea. Scenes in the streets, in the harbours, and on board the ships were described, mention being made of the method of "coaling ship," the various merchants and touters who visit the vessels with their wares, the soldiers, the sailors, and the natives. A visit to the market place in the early morning and the purchase of rich fruits at ridiculously cheap prices was described, as well as a visit to the celebrated Church of St. John.

Pictures of Alexandria were next shown and described, as also some views of Cairo and the Pyramids. While showing views of Port Said and the Suez Canal, the speaker explained the geographical and engineering features of that work, and compared its proportions with the Manchester Ship Canal. Although the Delphic oracle is reported to have said—

"Dig not the isthmus nor your money spill,
Jove could have formed an island at his will,"

Mr. Reed remarked that French engineers, by taking advantage of such local features as assisted their aims (the marshes at the Port Said end, Lake Timsah, and the Great Bitter Lake), and backed with the necessary capital, succeeded in overcoming a geographical difficulty, which at once made Africa an island and shortened the distance between Britain and India by nearly one-half.

After describing a visit to the town of Suez, the imaginary voyage was continued down the Gulf of Suez and the Red Sea. The lecturer was careful to explain that the waters of this sea are of the deepest blue, the name Red Sea being merely a translation from the older name, the Sea of Edom—the Edomites being the "Red men." The great heat, the appearance of sharks, the flitting of flying-fish, and a visit of a huge flock of seagulls were the incidents specially referred to during this part of the voyage.

Passing through the Straits of Bab-el-Mandeb (Gate of Tears), the speaker took his audience to Aden, on the coast of Arabia, now a British coaling station, which place, he explained, was taken from the Arabs by the Turks in 1533, who are said to have constructed the celebrated tanks, which are partly cut out of and partly built between the rocky side of a rift in the mountain side. A visit to the town of Aden, built in the crater of an extinct volcano, and to the tanks was described.

Passing eastwards, down the Gulf of Aden, the journey was continued, the high, rocky and inhospitable coast of Socotra being referred to in passing. Although a rough sea was raging in the Indian Ocean, due to the monsoon weather, on one

occasion when he passed, the lecturer explained that beneath the shelter of the high cliffs of the island the sea was perfectly smooth and calm. Reference was made to the different aspects of the Indian Ocean at different times of the year, sometimes the sea being as smooth as glass with scarcely a breath of wind to cause a ripple on its surface, although a restless swell always seems present; while during the monsoon period the waves are lashed into a raging fury. Mr. Reed told how on one occasion the vessel he was in was stopped in the Indian Ocean by signals of distress from a sailing ship, which sent a boat's crew on board, who explained that they had been many weeks becalmed and were suffering seriously from want of fresh provisions and lime juice. Their wants were, of course, relieved as far as was possible.

Point de Galle, Ceylon, the island of "spicy breezes," first visited by Europeans (the Portuguese) in 1505, was the next point touched at. The speaker briefly described some of the scenes he witnessed, and related some interesting and amusing personal experiences.

Leaving Ceylon, the lecturer took his audience across the Bay of Bengal and through the Malacca Straits to Singapore (City of the Lion), calling at Penang and visiting its celebrated waterfall on the way. Singapore, 80 miles from the Equator, was the most southern point reached. Several views of the town and harbour were shown upon the screen. Mr. Reed spoke of the richness of the fruits and the beauty of the vegetation.

Hong Kong (Sweet Waters, or Fragrant Streams) was next visited, a view of the harbour and town being shown, as well as pictures of the people. The lecturer described some of the various street and harbour scenes, as well as a pilgrimage he made to the top of the Victoria Peak in the early morning to witness the sun rise. He also gave some examples of "pidgin" (business) English as spoken by the Hong Kong natives in their dealings with English people. When a sam-pan man is asked why the junks in the harbour have eyes painted on their bows, he will probably reply: "If no have eye, how can see? If no can see, how can savey (understand)? If no can savey, how can go?"

Proceeding on the voyage by way of Formosa and the Loo Choo Islands, the shores of the eastern island empire, literally "the land of the rising sun," were at last reached. Mr. Reed spoke glowingly of his first view of the Japanese coast, with its varied landscapes stretching away inland, and with the graceful outlines of Fusi Yama, only discerned after careful gazing into the distance, but when once caught clearly outlined in grey tints against the morning sky. Its snow cap was plainly visible, but appearing at first glance like a white fleecy cloud hanging over the horizon. The sacred mountain of Japan, Fusi Yama (Rich Scholar's Peak), 14,000ft. high, ever figures in the background of Japanese scenes, but is now despoiled of much of its symmetry and beauty owing to the slipping of a huge portion of its graceful cone due to the recent earthquake. The lecturer described the town of Yokohama, speaking of the beauty of the European quarter (the Bluff), and the quaintness of the native town. The hotels, the shops, the tea-houses, the gardens, and jinrickshas were all referred to in turn, and various views shown upon the screen.

Tokio, the capital, also received attention, a number of photographs of the beautiful temples of Shiba being shown. Mr. Reed made amusing reference to the various people and sights to be seen in the streets of Tokio, and finished up with an account of an enjoyable up-river pic-nic, carried out with the aid of a steam launch.

The 278th Meeting of the Society, held on Saturday, December 30th, 1893, in the Cotton Waste Exchange, at 5 p.m.

A large number of the younger children of members were present on the invitation of the Victorians. The children were delighted with the lantern views exhibited, the legerdemain of Mr. Irlam, jun., and the games. They did full justice to the refreshments, which were attended to by lady members of the Society, one of whom gave a large cake, which was formally cut and distributed. The Chevalier Froehlich had sent a piece of Italian cake, from Captain Casati, which was exhibited.

First prizes in books were awarded to Miss Dora Margaret Gregory, and to Miss Irlam, for dolls dressed as Swiss and Italian peasants. Mrs. Pankhurst very kindly distributed the prizes and also some small toys.

Very hearty thanks were passed to the ladies who had assisted, to the Victorians, and to all others who had helped to make the gathering a success.

BELIZE, BRITISH HONDURAS.

COMMUNICATED BY THE REV. L. C. CASARTELLI, M.A., Ph.D., &c.

A MONTH'S METEOROLOGICAL OBSERVATIONS AND NOTES OF THE GREAT STORM, ST. JOSEPH'S OBSERVATORY, BELIZE.

Summary of Meteorological Observations during the month of July, 1893 :—

Days.	Barom. in inches.			Thermometr.		Psychrometer.				Anemom.		Sky.		Rain.	
	Max.	Min.	Mean.	Max.	Min.	Dry.	Wet.	Hum.	Dew.	Direction.	Velocity in miles for every hour.	Quality.	Quantity.	Days.	Inches.
1-7	30.06	29.70	29.93	89°	74°	83	79	80	76.3	E.S.E.	7½	C.N.	6	5	1.50
8-14	29.21	29.81	29.86	87°	74°	82	79	85	77.0	E.S.E.	6	C.N.	6	3	4.20
15-21	29.95	29.82	29.91	89°	73°	83	79	80	76.3	E.S.E.	3 ³ / ₈	C.N.	6	3	2.00
22-28	30.06	29.81	29.92	87°	74°	82	80	90	78.7	E.N.E.	4½	C.N.	5½	2	3.40
In the Month	30.06	29.70	29.91	89°	73°	83	79	80	76.3	E.S.E.	5½	C.N.	6	13	11.10

Explanation for the Sky : C. Cumulus, Sk. Cirrus, S. Stratus, N. Nimbus, o. quite clear, 10. quite covered.

There were two distinct waves of Atmospheric Pressure during July. There was on the 2nd a slight rise in the Barometer, but this was followed by a steady fall until the evening of the 6th. This fall presaged a coming storm, which turned out to be the most disastrous that the Colony has experienced for many years. It was felt along the whole coast from Corozal to Punta Gorda, a distance of 200 miles, but was worst about 60 miles South of Belize. The Barometer reached its lowest point about two p.m., when the Wind was S.E. and blowing at its maximum velocity from 40 to 50 miles an hour. Strangely, it fell still lower next morning, when the worst of the storm had passed—an occurrence for which we can give no explanation.

On the 13th it seemed as though there was going to be a second storm, but there was only a slight fall in the Barometer, and after a few hours it ended in a heavy fall of rain 2½ inches.

The Thermometer had a lower level than last month, but at times the heat was felt oppressive from the absence of the Wind. In the early morning, always after a

good fall of rain, the temperature went down to 74° and 73°, as on the 4th, 13th, 20th, and 24th.

In spite of the abundant rain the Humidity has not been high, probably owing to the long previous drought.

The prevailing Winds have been E.S.E. and E., and the Velocity has been for Belize at times very high; several times over 20 miles an hour, and on the 6th for the 24 hours the Anemometer recorded 123,640 revolutions, being an average velocity of 16 miles an hour.

Cumulus and Nimbus Clouds have been seldom absent during the month.

There were 7 days of heavy Rain, and on the 12th, 19th, and 22nd from 2 to 3 inches fell on each day.

Throughout the Colony health is good.

THE STORM.

A storm exceeding in violence anything which has been felt for the last six years raged during July the 6th along the whole coast, as far as some thirty miles north of Belize. Boats were driven ashore, houses unroofed or levelled to the ground, plantations destroyed, and there was also some loss of lives. The cyclone made itself felt with its greatest force about Punta Placentia, where it completely destroyed the settlement, and dividing spent its fury on the villages of Monkey River and Seine Bight, which was also in great part ruined. A few incidents of the storm which have come to hand will give a fuller account of the damage done.

And first as regards Belize. In the early morning of July 6th a stiff breeze began to blow from the North-East in Belize, and as the day went on it freshened to a gale. About 9-30 a.m., when the wind had a velocity of between sixteen to twenty miles an hour, the People's Hall, which was in an unfinished state, left without doors and window-frames, was caught in a whirlwind and fell to the ground with a loud crash. As the day went on the wind, which came and went in gusts lasting for not a full minute, increased in force and shifted towards the East. At this time some smaller sloops in the harbour, laden with logwood, seemed in danger of sinking. Towards 3 p.m. the wind shifted to the South-East; and now the squalls had at times a velocity of forty miles, with a steady force of twenty miles an hour. The incoming tide rose about a foot above high-water mark, and flooded all the low-lying lands. The effects would have been more disastrous if there had been a flood in the river, but fortunately the water was not high, and the storm was unaccompanied by heavy rain.

Turning now to the South, we heard from Punta Gorda that the wharf in front of Mr. Wells' store was carried away, that some five or six Carib houses were unroofed, and some smaller buildings levelled to the ground.

At Monkey River the storm began about ten a.m., the wind being N.E. It continued for about five hours, and during this period but little harm was done. Then for a short time there was a calm. The wind now came from the S.E., and began to blow with increasing violence. The incoming tide flooded Spanish Town, leaving hardly a few square yards of land uncovered by the sea, whilst some thirty-three houses were more or less destroyed. Coconut trees were blown down, doing serious damage to houses in their fall. The recently-built Catholic Church was raised from the posts on which it rested by the whirlwind, and fell to the ground, the wooden walls remaining, however, intact, though the roof was somewhat twisted and the floor broken up. All the boats in the harbour were blown ashore, some being buried deeply in the sand.

About ten miles north of Monkey River a boat in which was Mr. William Carroll, his daughter and nephew, was broken upon Rocky Point. Mr. Carroll was drowned, and the children had to pass the night in a mangrove tree. Next morning they walked into Monkey River, a distance of ten miles, having crossed twenty-two creeks on their way thither. They arrived feet and hands cut, and their clothes almost torn from their backs by the bush. At the first house they reached, a Mr. Garbutt's, they were kindly provided with some fresh clothes.

A little further north a boat was sunk off Seine Bight with a cargo of sugar on board; and nearly all the houses in the settlement were unroofed or destroyed.

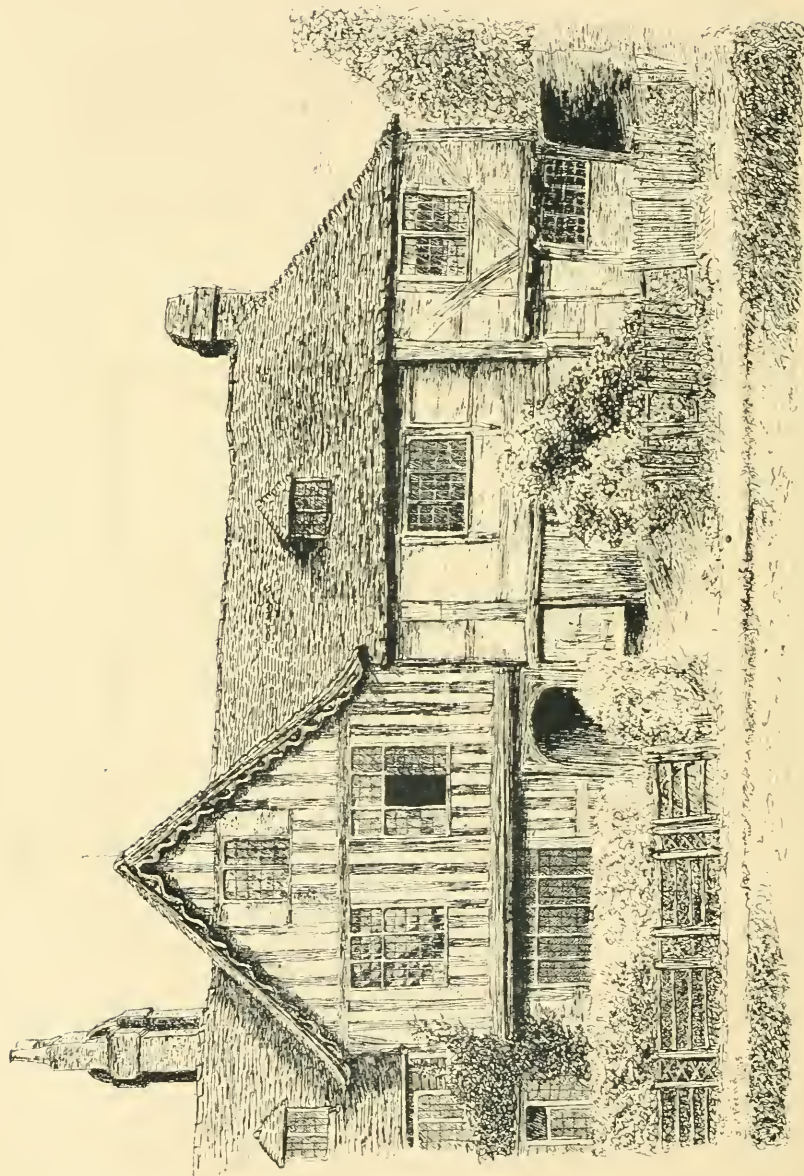
At All Pines the bathing crawl was broken by a boat which was dashed against it, and carried away by the wind. The sea covered the strip of land between the sea and the lagoon.

From Stann Creek we hear that the church tower rocked like a pendulum, and people were afraid that it would fall, but though the wind blustered a great deal, and the sea inundated the town, not much damage was done.

North of Belize the hurricane was less felt, but still it did some damage. At Salt Creek the sloop Florence was wrecked and two men narrowly escaped drowning. Whilst breakfast was being prepared for some thirty labourers the roof of the house was blown in, and the cooks, much frightened but not hurt, had to begin their preparations all over again.

The s.s. Freddie M—, which was on her way from Corozal to Belize, was caught by the gale off Northern River, and both there, off Salt Creek, and again on entering Belize, nearly toppled over. So nearly was she over that we were told some passengers took off their boots to be more ready to swim.

Such are some of the incidents in this most disastrous of storms, which has laid low the plantations throughout the south of the colony, and in a day destroyed the fruit of months of labour. On July 13th it seemed as though there was to be a repetition of the storm of the previous week; but though in the early morning the wind was very strong, and the sky covered with dark, threatening clouds, after an hour or two the wind decreased, and the storm ended in a heavy downpour of rain.



THE STUDIO OF THE LATE MR. T. WEBSTER, R.A., AND NOW OF MR. F. D. HARDY, AT CRANBROOK, KENT.
To illustrate paper by Mr. J. C. Blake, F.R.G.S., F.L.Inst., on "A Holiday in Kent and Sussex," page 190.

THE JOURNAL

OF THE

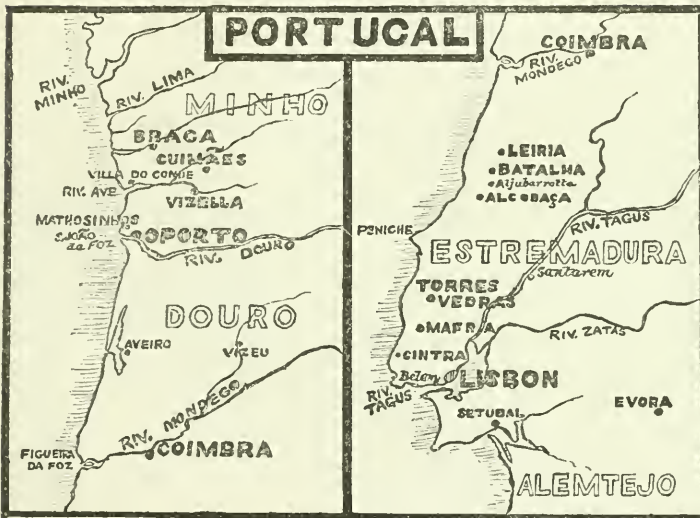
MANCHESTER GEOGRAPHICAL SOCIETY.

NOTES OF A JOURNEY IN PORTUGAL IN 1893.

(Map and Illustrations.)

By Mr. E. W. MELLOR, J.P., F.R.G.S., F.I.Inst.

[Addressed to the Society in the Memorial Hall.]



THERE seems to pervade the average mind a notion that Portugal is a country redolent only of garlic and all that is unpleasant. I hope to show you that so sweeping a condemnation is unjust. Shall we not say that a country once the mistress of India—the mother country of Brazil, a country that for five hundred years has been the ally of our own country, and whose soldiers within the present century fought side by side with our own soldiers, and that in so gallant a manner as to win the praise of our stern old general, the great Duke of Wellington—shall we not say that such a country not only merits more than a merely passing thought, but will also provide much to interest us? And such a country is Portugal.

VOL. IX.—Nos. 10-12—OCT. TO DEC., 1893.

Geographically, Portugal is the smaller portion by far of what was anciently called the Iberian peninsula, that tract of land separated by the Pyrenees from the rest of Europe. The prehistoric inhabitants of the peninsula were exterminated by the wave of that great Aryan or Celtic race which swept all over Europe. Strabo tells of ancient Greek colonies at the mouths of the Portuguese rivers. We then hear successively of the Phœnicians, the Carthaginians, and the Romans in the peninsula. The Romans made good their hold 185 years B.C., and we find that the Emperors Augustus and Hadrian divided the peninsula into provinces, one of which was Lusitania, which included a large part of Portugal. The Portuguese writers of the sixteenth century—the Renaissance period—delighted in calling Portugal by this classic name, Lusitania. The dominion of Rome continued for about seven hundred years. A beautiful ruin of one of her temples still exists at Evora (the temple of Diana). A more lasting relic of Rome is left, however, in the Portuguese language, which is modelled on or developed from the Latin.

In the fifth century came the conquering Visigoths, who established their empire until the eighth century. Then the Moors came across the Mediterranean from Africa, and in their turn became masters of the peninsula. The Moorish Sultans exercised a wise and tolerant rule for three hundred years, and architectural remains show to what a height of prosperity and even luxury the country then attained. In the eleventh century the flower of the Christian chivalry of Northern Europe came into the peninsula to win its spurs against the unbelievers. One of the most admired and followed of these chivalrous knights was Rodrigo Diaz de Bivar, better known as the Cid. The peninsula was now divided under the name of counties among a few of these knights who were styled counts. In the twelfth century a great and decisive victory was gained over the Moors at Ourique by the Count of Oporto, the great hero of Portugal, Alfonso Henriques. Alfonso Henriques threw off the Castilian yoke, and became the first king of Portugal, and from that time the history of Portugal as a separate and distinct nation may be said to commence.

In the fourteenth century the king, Dom João I., or "The Great," as he is called, married Philippa of England, eldest daughter of John of Gaunt, "time honoured Lancaster." Their third surviving son was Henry, called "the Navigator." Prince Henry the Navigator it was who did so much in the next, the fifteenth, century to cause Portugal to become a name renowned throughout Europe, for with a view of increasing the commerce and wealth of Portugal he sought out bold and intrepid captains to explore the unknown seas, and it was his efforts that led to the doubling of the Cape of Good Hope by

Bartolomeo Diaz (after the death of Henry), and the discovery of India by Vasco de Gama. In the chapel of the great cathedral of Batalha lies Prince Henry's tomb.

This was the heroic age of Portugal. In the beginning of the sixteenth century Portugal discovered and made herself mistress of Brazil. At this period Portugal was at the height of her glory. With the latter half of the sixteenth century came the gradual decline of Portugal. In the seventeenth century the Portuguese rule in India and Brazil was almost entirely destroyed by the Dutch. In the eighteenth century Portugal lost her power in India, and suffered a severe calamity at home in the great earthquake which destroyed Lisbon. With this, the nineteenth century, came the Peninsular War, when Napoleon Buonaparte threatened to absorb Portugal, but thanks to the English alliance and the masterly generalship of the Duke of Wellington, she preserved her independence.

If we examine a map of Portugal we shall find that Portugal is divided from Spain by chains of mountains so steep and impracticable that the political frontier has been described as resembling "a long thick wall with only a few breaches to permit the passage of foaming and rushing rivers." Portugal is about 350 miles long from north to south, and about 150 miles broad from east to west. Let us suppose that we land from our steamer at Oporto, or, as the Portuguese call it, "Porto," "O" being simply "the." Oporto then means "the Port," which gives its name to the country and to the wine from its vineyards.

From Oporto, which is the chief town of the Douro province, we go through the village of Mathosinhos, and the little town of Villa do Condé, to Braga, the chief town of the Minho province, where we can visit the curious sanctuary of Bom Jésus. The Minho province from its scenery is sometimes called the Portuguese Tyrol. We can then go from Braga to Guimarães, where Alfonso Henriques spent his boyhood. Thence to the pretty little town of Vizella, where there is a sulphur spring, which if it were in Germany would cause Vizella to be known as Vizella-bad! To the south is Coimbra, the great university town, the Oxford and Cambridge of Portugal.

Entering the province of Estremadura, which we must not confound with the Spanish province of that name, we arrive at Leiria, where are the ruins of a castle founded by Alfonso Henriques. From there we can go on to Batalha, a royal Dominican monastery containing the tomb of Prince Henry the Navigator. At Alcobaca there stands the largest monastery in Portugal, now used as a cavalry barracks. The heights of Torres Vedras recall the Peninsular War. After visiting Mafra, with its enormous combined palace and convent, a short expedition can be made to Evora, the centre of the cork industry, and one of the chief towns of the province of Alentejo, to see the

remains of the Roman temple to Diana; and at Setubal we are at the great orange and sardine shipping port of Portugal. By way of Cintra we then approach Lisbon, a beautiful spot near the sea, quite a fashionable suburb of Lisbon—indeed one writer says, “As Richmond is to London, so is Cintra to Lisbon.” Lisbon, the capital, is a large city with a magnificent harbour near the mouth of the Tagus, and finally on our homeward voyage we embark opposite the historic old tower of Belem.

For the size of the country Portugal presents to the Atlantic an extensive coast line. This probably accounts for her having been a nation of mariners from such early times. Portugal, too, has the advantage of possessing the lower portions of the rivers Douro and Tagus, which serve as great water highways. These rivers flow the greater part of their course in Spain, and it is an old complaint of the Spaniards that they are deprived of the mouths and of the navigable part of their principal rivers. The Mondego is the largest river which flows its entire length in Portugal.

Let me ask you for a moment to cast your minds back to the Peninsular War.

In 1808 the Duke of Wellington landed with his army at the mouth of the Mondego, and at the battle of Vimeiro defeated one of the great Napoleon's chief generals, Junot, who had established himself at Lisbon, but who now evacuated Portugal. Marshal Soult then descended upon Oporto, and Wellington marched to the relief of Oporto and drove out Soult. Napoleon then sent Massena to capture Lisbon and turn the English out of Portugal. Meanwhile the allies, who were masters of the Tagus, and could not be attacked by water, quietly constructed by Wellington's orders, from the Atlantic to the Tagus, commencing near Torres Vedras, three lines of fortifications, one behind the other—so that, even if one or two lines were taken, Wellington calculated that Massena's resources would be exhausted before the third line could be captured. The result proved the accuracy of Wellington's methods. The French were unable to pass the famous lines of Torres Vedras, and evacuated Portugal for good, after three invasions during the war.

The bar of the Douro is a very dangerous one, and has proved fatal to many good ships. About four miles above the bar lies the ancient and picturesque city of Oporto.

From the grounds of the Crystal Palace there is a fine view of the principal anchorage of the ships at Oporto. It is from Oporto that port wine is so largely shipped. The wine takes its name from this port.

Standing in Oporto proper, the buildings across the river (virtually an extension of the city) form a suburb called Villa Nova de Gaia, where are the wine lodges or stores of the prin-

cial merchants. It is the ancient "Portus Cale" of Roman times, from which is derived the modern name of Portugal.

Referring again to the Peninsular war. In the year 1809 Marshal Soult had made himself master of Oporto, and had established himself and his army here in comparative security. The Duke of Wellington, with the allied army of British and Portuguese soldiers, marching from the south to the relief of Oporto, took up a position behind the Serra Convent, on the Villa Nova side of the Douro.

From the Serra Convent a good view is obtained of Oporto. A prominent object is the wonderful bridge, connecting Villa Nova with the city. It is double. The high-level roadway is 200ft. above the river, and 166ft. below this is the low-level roadway about 34ft. above the water-level. The streets rise very steeply from the river-side—so steep, indeed, are they, that in order to draw up the tram cars they require to have four or five mules harnessed to them.

In this bridge there are 3,300 tons of metal. It occupied about five years in building, and cost about £82,000. It was opened by the King, Dom Luiz I., father of the present king, on the first of November, 1866.

To the right is a large building, which is the Cathedral, and adjoining it the Bishop's Palace, both of which we visited. On the left is the Exchange, and above all is a church tower, the Torre dos Clerigos, one of the highest in Portugal.

No such bridge existed here on the 12th of May, 1809, when the Duke of Wellington, then Sir Arthur Wellesley, stood on this spot regarding the city, firmly in the occupation of the enemy, led by Soult, one of the ablest of Napoleon's generals. Napier writes that the great object of the campaign demanded the immediate passage of the Douro. But how to pass a river, deep, swift, more than 300 yards wide, when 10,000 veterans lined the opposite bank? was a question. Wellington's eagle eye caught a large building, isolated, surrounded by a high wall, with easy access from the river, offering room for two battalions. Here, with marvellous hardihood, Sir Arthur resolved to force a passage in face of the veteran army and a renowned general. Silently and unperceived a boat put 25 men across, who gained the building; a second boat followed; and then a third passed across, upon which a tumultuous noise was heard through Oporto.

The French rushed to the attack, and during the surprise masses of troops crossed the river. A terrible carnage ensued; the artillery of the allies from their side played havoc with the enemy's columns on the opposite bank.

Such was Wellington's famous passage of the Douro, which restored Oporto to the Portuguese.

Wellington's great point of vantage, the Serra Convent, was almost entirely destroyed in the civil war which preceded Dom

Miguel's accession to the throne in 1827. This convent anciently was, as the poet expressed it—

Half Church of God,
Half castle 'gainst the Moor.

The sacristy of the convent is in ruins, the iron bars torn and twisted, the walls battered by cannon-balls, a noteworthy object of remark, reposing peacefully as we see it under the shady drooping leaves of tall eucalyptus trees. Through the window you see the cross surmounting the convent church. The more perfect part of the conventual buildings is now converted into artillery barracks; and we see some of the gunners, commanded by a sergeant. The officer in command very courteously allowed me permission to photograph the convent.

We now returned to the Oporto side, or right bank of the river, and entered the building to which Wellington sent those few soldiers, a boat load at a time, to occupy, and who found it to be a ruin. It is called the Seminario, and is all that is left of the building in which the Holy Inquisition formerly held its court. Standing here, on a brilliant June Sunday afternoon, I became quite oppressed with the thought of the frequent sufferings and death which these old walls once probably witnessed. To add to the gruesomeness of its surroundings this Seminario stands at the side of a huge cemetery, a situation all too suggestive of the sentences pronounced by those dread Inquisitors of old.

Leaving that gloomy spot—though from its connection with the passage of the Douro, full of proud memory for Englishmen—we mounted to the highest part of Oporto, and found ourselves at the foot of the great Torre dos Clerigos. We saw this tower from the Serra Convent, raising its head above all its surrounding buildings—indeed it stands up a beacon that for thirty miles around attracts the wayfarer to the city. This campanile tower rises to a height of 210ft., and is the highest in the country, except those of Mafra. It was built in 1779 at the expense of the clergy—hence its name, “Torre dos Clerigos.”

Passing along the street to the left of the tower we enter the principal square of Oporto. This square is called the Praça de dom Pedro, from this equestrian statue of Pedro IV., by a French sculptor named Calmels. It is also sometimes called “Rolling Motion Square,” from the peculiar wavy setting of the light and dark stones of the pavement. The Portuguese seem fond of this wavy undulating pattern. We find the principal square at Lisbon also paved in this manner; and I saw women wearing dresses with this wavy pattern in the most brilliant and striking colours.

The opposite building is the Casa Camera, or Town Hall, a somewhat insignificant building compared with the size of the square. Through an open doorway I saw the fire engines ready for action at a moment's warning.

We now come to the Cathedral, which, as you will remember, we saw in the distance from the Serra Convent. I took a photograph of the north-west side of the Cathedral. It is built entirely of granite, and stands upon the ancient site of a fortress of prehistoric times. There is a curious arcade in which is the north door, and standing in front is a policeman. The Portuguese police uniform is brown, and, in addition to the short sword so generally seen on the Continent, the Oporto police, since the last revolution, carry a revolver—a somewhat dangerous weapon. The interior of the Cathedral has been modernised in a style not strictly in accordance with the antiquity of the building. The high altar and the choir is richly gilt. Gilding, too, has been laid heavily on the pillars behind the altar.

To the left of the high altar is the chapel of the sacrament. This chapel contains an altar front, tabernacle and re-table of solid silver, a most costly work and one which repays close examination. The silver is considerably tarnished. The French, when they were in possession, carried off church plate, and anything of value upon which they could lay their hands. They were preparing to carry off this silver altar, when their arrangements were disturbed by Wellington's unexpected arrival among them. So well executed, indeed, was that daring passage of the Douro, and so complete the surprise, that it is said Wellington and his staff ate the dinner which was cooking for Soult. On the south side of the Cathedral is a good cloister court, and which contains in the centre a tall cross. The cloisters were built in 1385, and the interior walls are lined with "azulejos," or coarse blue and white tiles, like Dutch tiles, illustrating mystical subjects from the Song of Solomon. This kind of mural decoration (tiles) is very common in the Portuguese churches. The cloister on the right leads to a handsome sacristy containing some very rich vestments. Above is a chapter house, or large chambers for ecclesiastical purposes.

Adjoining the cloisters and the Cathedral building is the Bishop's Palace, a huge pile of building which we saw from the Serra Convent. A granite staircase is the object of greatest remark in the Bishop's Palace. The staircase is of noble design.

Perhaps the finest building in Oporto is the *Palacio da Bolsa*, or Exchange. The south side of this Bolsa is built up to the west-end and north-side of the church of St. Francis, one of the oldest churches in Oporto, in so peculiar a way that it is almost difficult to say at first glance which is church and which is Exchange. The same flight of steps leads to both doors—the door of the Exchange is within the church wall. The doors, in fact, are side by side. "Bolsa" is marked over the one door, and next is the church door. In 1861 a great exhibition was held in the Bolsa or Exchange.

We made a day's boating expedition up the Douro from

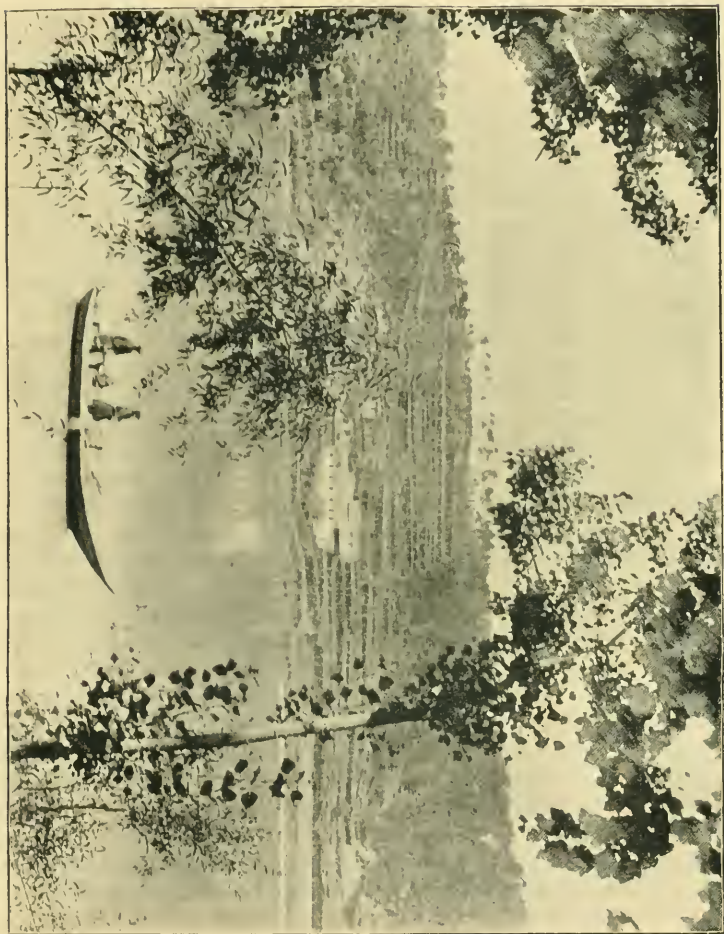
Oporto. Across the river we saw the terraced vineyards which line the banks of the Douro. Upright poles, connected by a cross-pole at the top, are fixed in the ground at regular intervals for a considerable distance, and the vines are trained over them, presenting a pretty terraced-like effect. They are called "Ramadas." The vine is usually grown in this way in northern Portugal. In southern Portugal the vine is generally grown in a low stunted bush, something like a gooseberry bush, and I am told that the grapes for port-wine are usually grown in this way in the Douro district.

On the Douro above Oporto are villages. The boat I hired is covered by a wooden awning, which is a grateful protection from the heat of the morning sun, which in this latitude is so powerful that a lucifer match placed against the wooden roof immediately took fire. A peasant boy is a picturesque object in his white jacket and red cap. Some we saw carried in their hands an ox-goad, a long pole with a sharp point. At the stern of a port-wine boat is a long steering pole, which sometimes is as much as 60ft. long. It is worked from a raised platform.

The port-wine vineyards are all in north-east Portugal, and the river Douro is the highway by which the pipes of port are conveyed to the merchants' warehouses, called "lodges," in Oporto, and there prepared for shipment. From 40,000 to 50,000 pipes of port-wine are annually exported from Oporto, and of this upwards of two-thirds come to England. The best qualities, even in good vintage years, cannot be made very cheaply. In a cheap port-wine you probably get, in addition to the juice of the grape, elder berries and prune syrup to give a rich colour, molasses and alcohol to impart sweetness and dryness, and perhaps a modicum of vitriol to counteract any germ of decay in so rich and fruity a wine, also to enable it to stand travelling. Some of these Douro wine boats proceed under sail, the steering being accomplished by a huge pole, the man walking across the raised steering platform.

Next to the English, the Brazilians are the best customers of Oporto. In addition to wine, early vegetables are forwarded from this part of Portugal to London and to Rio de Janeiro.

On the sandy sea-shore of the little village of Mathozinhos, about six miles north of Oporto, stands a shrine which owes its existence to the following legend: "Ages ago, one of the arms of the wooden image of our Saviour in the neighbouring church was missing. Soon after, a poor woman, searching for drift-wood to boil her 'pot-au-feu,' found on this spot what was apparently part of a spar. She took it home, and tried to make a cheerful blaze with it, but the glowing embers recoiled from it, and the flames went out; then she dried the wood in the sun for some days, but all in vain; as often as she put it on the fire, out went the flames. The woman became alarmed and told the strange



THE RIVER DOURO, WITH VINE TERRACES (see page 234).
From Photograph by Mr. E. W. Mellor, J.P., F.R.G.S., F.L.Inst.

story to the priest, who speedily cleared up the mystery. No wonder the flames recoiled, for the supposed spar was nothing less than the missing arm of our Lord of Mathozinhos! Great was the poor woman's terror when she heard of the sacrilegious deed of which she was guilty! As she had thus sinned unwittingly, however, she received absolution. The arm was restored, and on the spot where it is believed the woman found it this shrine was built."

An image that has thus encountered the perils of the sea is thought to exercise a special protection over mariners. It is, therefore, to them an object of great veneration and devotion. There is an altar, and before it a tall cross, carrying a lamp with a light always burning. Behind the shrine is a well, from which women carry on their heads jars full of water.

We now left Oporto, and pursued our journey northwards, pausing at the village church of Azurara. It is late Gothic, and has one or two peculiarities which, I think, fairly well illustrate the Portuguese country churches. The idea which first strikes us is the smallness and fewness of the windows, which makes the place very dark. There is a gallery or balcony. It is nothing less than an outside pulpit, from which it was formerly the custom for the monks and holy fathers to preach to the passers by. At the corner is a tall crucifix.

Sixteen miles north of Oporto we arrived at the little fishing town of Villa do Condé, situated on the estuary of the Ave, about one mile from the sea. The most conspicuous building in Villa do Condé is the large Convent, or Nunnery, of Santa Clara. The convent is celebrated for its aqueduct, bringing the water supply to the establishment. The aqueduct is carried on 999 arches of granite, and is upwards of three miles in length. It ranks next in importance to the great aqueduct of Lisbon.

The Portuguese government does not allow any young woman to become a nun. The consequence is that the nuns in all the convents have been gradually dying off, and the government has appropriated the convents for their own purposes, barracks, and so forth. Two or three days before I visited this spot last summer the last nun in the Convent of Santa Clara, an old lady upwards of 80 years of age, died, leaving the building empty. The convent will probably ere long be converted by the government to some military purpose. I was told that Portuguese ladies who desired to devote their lives to their religion came to England to "take the veil," finding here a greater freedom than in their own country.

On the bank of the river before the little town of Villa do Condé is an open space in which stands a quaint old column. We may call it the "Traitor's Pillar," for the decapitated head of any person executed as a traitor was stuck on this spike. The arm holding a drawn sword typifies the sword of justice. An

Oporto friend of mine told me that, passing here one day a few years ago, he smiled at this relic of a past barbarism, but he was checked by an old boatman, who said: "Ah, sir, do not laugh. I feel more inclined to cry, for I have seen the head of many a strong man, friends of my own, wither in the blaze of the noon-day sun on the top of that pillar." This incident shows that the pillar has been used for its old ghastly purpose within quite recent years—no doubt during the storms of revolution which have agitated Portugal during the present century.

Away in the distance on the right is the tower of the church at Azurara, which has the external pulpit mentioned before. A long white building in its grounds is the quinta of a fidalgo, *i e.*, a gentleman's country seat, or estate, which embraces park, gardens, farms, vineyards, or any or all of them.

The district round Villa do Condé is entirely agricultural, and in a field near that little town I saw the primitive operation of ploughing. Two big sleepy-looking oxen are yoked to an antiquated looking, single-handled plough, the front end of which is carried on a pair of wheels cut out of the solid wood. The man carries an ox-goad, with which he occasionally wakens up the animals.

The carts, both in the town and country, all have wheels cut from the solid wood, and are drawn by oxen, to which they are attached by the ox-yoke. These ox-yokes are ponderous beams of wood, frequently chestnut, fixed between the necks of the animals. Many of them are very handsomely carved, and almost black with age, being handed down from father to son. These solid wood wheels are a fixture on the axles. In the country districts the peasants have a superstition that it is unlucky to oil the axles of their carts. The revolving axles therefore make a fearful groaning, creaking, and squeaking, which you can hear long before you can see the cart.

The next point in our journey was the ancient city of Braga, 34 miles north of Oporto, the most northerly point of Portugal we touched. Braga stands upon the site of the Bracara Augusta of the Romans, said to have been founded 296 years B.C. Braga was, perhaps, the most important town of the early Portuguese monarchy, but when the maritime discoveries of the fifteenth and sixteenth centuries brought wealth and magnificence to the sea-ports of Oporto and Lisbon, Braga lost its splendour. The cathedral buildings are large and rambling. A portion of the cathedral abuts upon the principal street. The principal entrance is on the right, and there are fine life-sized carved figures in the gallery over the side door. The gallery also serves the purpose of one of those outside pulpits such as we saw at Azurara a few minutes ago.

This cathedral was originally the work of Affonso Henriques, the first king of Portugal, in 1112, but it has been almost

entirely rebuilt. It contains an ancient eleventh century chalice, said to have been used at the baptism of the same Affonso Henriques, the national hero.

I saw in this cathedral a strange and somewhat weird object. It was the embalmed and preserved body of the 86th Archbishop of Braga—Dom Lourenco de Lourinha—the warlike prelate who wore his episcopal robes over a suit of armour, and fought so valiantly at the battle of Aljubarrota, in 1385, when the Portuguese utterly routed the Castilians.

The Archbishop's Palace is close by the cathedral. In the centre of the forecourt is a handsome fountain, surmounted by a figure carrying a hollow ball. This hollow ball was used as a national emblem by the king, Dom Manoel, "the fortunate," after the discovery of India by Vasco da Gama, in the fifteenth century. It is supposed to represent the two halves of the globe, and the meaning attached to it by Dom Manoel was "Half the world is mine." Many of these hollow balls, or armillary spheres, have been placed in different parts of Portugal. We saw one at Lisbon. The fountain was erected here in 1723.

We may judge of the climate here in Braga from the palm-trees flourishing in the open-air. We notice, too, that the tiled roof is quite devoid of chimneys. We shall notice this wherever we go. The climate is so warm that the Portuguese never think of building fire-places in their houses, excepting only the kitchens. Some of the old houses in Braga are interesting, with the low rooms, and the many small windows, all covered by lattice shutters to keep the rooms cool. They have low pitched tiled roofs, and no chimneys visible, imparting an almost Oriental aspect to the place. There is here another Portuguese peculiarity. The doors and windows are all consecutively numbered, so that your next-door neighbour may be several numbers away.

The amateur photographer is not so common an article in this remote corner of Europe as here in England. My camera and I caused quite an excitement among a crowd of persons behind me, and the people at the windows. They discussed my business in shouts over my head, from one to another, and finally agreed, to their own satisfaction, that I was taking the portrait of a church at the extreme end of the street. As the church was a good way off, and rather round a corner, I think it displayed considerable unsophistication in matters photographic.

It is in this part of Portugal that religion is perhaps the most sincere. One of the Archbishops of Braga, by name Rodrigo de Moura Zelles, conceived the idea of founding a pilgrimage shrine on a mountain, four miles out of the town. It is a beautiful and remarkable place. It stands about 1,850ft. above the level of the sea, and is called Bom Jésus do Monte—Good Jesus of the Mountain.

A road winding under cypress, cork, and olive trees, leads up to the church, or you may ascend in an elevator like that at Folkestone, Scarborough, and other places. The devout ascend by the Via Crucis, or as it is also called, the "Pilgrims' Staircase." It is a double staircase, and a series of fountains, one on each landing and all of different design, look cool and pleasant as we climb round each bend.

Chapels containing life-size figures illustrating the story of the Cross are placed at intervals from top to bottom. The great time for the pilgrimage is Whitsuntide. Groups of peasants start very early in the morning from the bottom. At each of the chapels—there are about fourteen of them—they stop, and pray, and sing, and so gradually work their way to the top. The last landing has also its fountain, and above is the last flight of the pilgrims' staircase. A few of the very devout will make the ascent on their knees, in the fulfilment of some pledge. I myself saw a woman going on her knees twice round the outside of this Church of Bom Jésus, and a slow, painful business it looked.

Arrived at the top, the worshippers enter the church, and prostrate themselves in supplication before the different altars, or attend Mass; and then, about eleven o'clock, they have done. The rest of the day is given up to pleasure and jollity; the bells jangle out lively tunes with only a few minutes' interval; the people dance under the trees round the Church; sky-rockets are let off; and very odd this looked at noon-day to my English eyes. It is done for the sake of the noise, which seems to be the Portuguese notion of festivity to which all is now abandoned. We saw a group of peasants who had finished their devotions in the Church of Bom Jésus, and were crowding round a fruit and cake seller for some refreshment before commencing lighter amusements. The women were clad in the brightest colours, and the gay handkerchief over the head afforded some protection to the head and back of the neck from the scorching rays of the sun, and at the same time allowed them to carry whatever they pleased on their heads. It is the universal custom of the women to carry everything on the head; I have even seen in Portugal a woman carrying her dead child on her head.

At these fêtes, or "festas," as the Portuguese call them, there are cake-sellers. One of them wears a most brilliantly-coloured handkerchief over a zouave jacket; round her neck she has a large gold chain from which hangs a large ornament, and very large ear-rings. She is evidently well-to-do. In their holiday costume the women put on all the petticoats of which they are possessed—it is a mark of their social position—and the more a woman seems weighed down with clothing the more affluent are her circumstances.

We now went in a south-easterly direction, and arrived at

the old royal town of Guimarães, the birthplace of Affonso Henriques.

The Collegiate Church is dedicated to Nossa Senhora da Oliveira—our lady of the olive tree—from the quaint legend of one Wamba, who once on a time was elected by the inhabitants of this place as their king. He refused so troublesome an office, and the more he was pressed the more he resisted. At length he struck his iron-shod olive-staff into the ground, and swore by the four evangelists that he would not rule until the olive-staff should blossom. Suddenly branches shot out from the staff in all directions and it became a green tree. Wamba then fell on his knees on this spot, and prayed for wisdom and valour to govern aright. At the base of the church tower is a fountain, and we saw a girl and boy washing out a large wine bottle covered with basket-work. Such bottles are used for the “green wine,” as it is called, which is the usual drink of the peasantry.

We then saw the Casa Camera, or Town Hall, at Guimarães. It is carried on short massive pillars with pointed arches. Over the windows are King Manoel’s hollow spheres. The space underneath is used as a sort of market-place. When driven out of Oporto by Wellington, Marshal Soult had a fall from his horse and seriously injured his hip, but in spite of pain and weakness he led his troops, dismayed and worn out with fatigue, safely into this little town of Guimarães.

Up the narrow street, on the right of the building, is the now disused Convent of Santa Clara; it is another of the religious houses which the Portuguese Government has put down. The windows are shut in by close gratings, to prevent the nuns being seen by the outside world. In the convent churches, too, we found a grating right across the church. The nuns are kept on one side of the grating, while the public is admitted to the other.

The old Castle of Guimarães is extremely interesting, from the fact that it was the residence of Count Henry and Donna Theresa, the father and mother of Affonso Henriques, and the place where the boyhood of that king was spent. The outer walls are perfect, and the keep is entered by a wooden bridge. The walls are said to be 900 years old, and the keep still older.

The story of the early years of Affonso Henriques abounds in miraculous legends, *e.g.*, fire playing round his cradle without hurting or terrifying the future hero; and, as a boy, fighting the wolves on the mountains round Guimarães as he afterwards fought with the Moors. His tutor was a brave and high-minded nobleman, named Egas Moniz. This nobleman and the prince’s mother had promised that Affonso should take the oath of allegiance to the King of Castile, but when he came of age

Affonso refused to do so. Then Moniz, now an old man, went barefoot to the King of Castile, with a halter round his neck, followed by his wife and family, to atone by his death for the violation of his oath by the young prince, his pupil. Egas Moniz was pardoned, and Affonso Henriques, honouring his loyalty to his word, held him up as an example to his courtiers, saying, "What great things will not the pupil of such a noble knight be able to perform!"

At the foot of the castle hill at Guimarães I saw a group of women, sitting out in the open before their cottages, busily engaged winding pirns for handloom weaving from the hank. Compared to the rapid machinery with which we are familiar in Lancashire this seemed a very slow and tedious way of doing things.

Now, continuing our journey, a few miles brought us to Vizella, a little town prettily situated on the Ave, which river runs into the sea at Villa do Condé, where we saw the Traitor's Pillar a short time ago. Vizella has a hot sulphur spring, the waters of which are not unlike Harrogate water. This has brought two or three good and large hotels to Vizella, and it is deservedly a favourite resort of Oporto people. The women do their laundry-work in the running water of the river.

We took a short stroll by the river-side. We found the river afforded many pretty views; in fact, Vizella is quite one of the prettiest places I visited in Portugal. Within a stone's throw of the spot where we stood were men sprinkling powdered sulphur over the vines, which were growing up the trees, in order to destroy the insects. It is a remarkable fact, and one not quite satisfactorily accounted for that, since the use of sulphur for this purpose was brought into vogue, the men engaged in the culture of the vines are no longer attacked by a distressing itch from which they previously suffered. In a cottage close to this spot I saw a woman weaving capital linen towels in a handloom.

Our journey now took us southward to Coimbra, the great University town of Portugal, and the third most important city in the country, with a population of upwards of 15,000 inhabitants. Coimbra stands on the banks of the Mondego, the largest river which flows its entire course in Portugal alone. The University buildings, seen across the courtyard from the astronomical tower, are very fine.

Portugal's greatest poet, Camoens, in his famous epic compares Coimbra to a second Athens in these lines—

From Helicon the Muses wing their way,
 Mondego's flowery banks invite their stay;
 Now Coimbra shines, Minerva's proud abode;
 And, fired with joy, Parnassus' blooming god
 Beholds another dear-loved Athens rise,
 And spread her laurels in indulgent skies.

A few minutes' walk from the University is the Sé Velha, or old Cathedral, one of the finest buildings in Portugal. The eaves of the roof are surmounted by a battlement, and it is shortly described by the Rev. A. C. Smith as "a fortified church, which with its thick massive walls, and solid sturdy buttresses, not only looks as if it could stand a siege, but, with its handsome though delapidated western doorway and window above, looks as if it had stood a siege, and that too a severe one. It has witnessed many a stormy scene, for hither in troublous times repaired more than one sovereign including the famous Cid, when for a short period Coimbra enjoyed the proud position of capital of the newly-erected kingdom of Portugal." The church is set on the side of a steep hill, with a level plateau, and a steeply-descending street on the left.

In 1129, the then bishop permitted his canons to abandon the life of cloistered monks, and to acquire private property. The archdeacon, the prior, and others, refused to agree to such a violation of ancient discipline, and resolved to continue the strict rule of canonical life. They obtained a site from Affonso Henriques, and in 1131 he laid the foundation of a monastery, dedicated to Santa Cruz, the Holy Cross. The west door is remarkable in that it is as it were a porch, for with these great doors closed it is possible to drive inside these railings under the doorway and there alight.

The Church of Santa Cruz is of immense interest to us from two tombs which it contains on the north and south side of the choir. The tomb on the south side is that of the second king of Portugal, Sancho I. The crowned effigy of the king is recumbent on the tomb, under a beautiful and elaborate canopy. The Latin epitaph runs—"Sancius Primus, Lusitaniæ Rex secundus Difficillimis Temporibus regnans, Ceu Patriæ Pater, Regumque Exemplar Egregium, Obiit anno *MDCCXI*, Aetat *LVII*." The epitaph may be translated thus: "Sancho I., second king of Portugal, reigning in those boisterous times like the father of his country, and as the chosen pattern of kings, died in the year 1211, aged 57."

Opposite Sancho's tomb stands a still more elaborate one—that of his father, Affonso Henriques, the first king and national hero of Portugal, whose boyhood's home we found at the castle of Guimaraes. The recumbent figure of Affonso—a thin face, with strongly-marked features and a long beard—is here. The sculptor would appear to have originally forgotten the crown, and as I suppose it would scarcely do to cut away the pillows to receive it, the crown has been pushed over Affonso's forehead somewhat jauntily.

Affonso Henriques, as I mentioned at the outset, succeeded his father as a count dependant on the Castilian Court, but after nearly sixty years of incessant fighting he bequeathed a powerful

little kingdom, of unquestioned independence, to his son Sancho, whose tomb we had just seen.

After these two monarchs had lain in their tombs for 300 years, King Manoel had these ancient sepulchres opened in his presence on the 25th October, 1515. The body of Affonso Henriques was raised from its coffin, and placed on a throne covered with crimson velvet and gold; a crown was put on its head, a sword in its right hand, and a shield on its left arm.

Dom Manoel, followed by his nobility, first kissed the hand as that of a king, and then the feet as that of a saint. The same ceremony was performed to the body of Sancho, and then both monarchs were again committed to their tombs. So runs the chronicle.

An apparition of Affonso Henriques is said to have been seen in this church when John I., husband of Philippa of England, conquered Ceuta in 1415, at the moment of battle. As we wandered through this door into the cloisters, I read a few lines in which this apparition is recorded—

In Santa Cruz at Coimbra
 The monks were saying tierce;
 And scanty through the windows
 The storied sunbeams pierce;
 When clang'd the gates and clash'd the floor
 Of God's serene abode;
 And right, right up to the chancel door
 A kingly spectre rode.

Then canon gazed at canon,
 And monks together press'd,
 And there was awe and terror
 And cro-sing of the breast;
 Till by the earl's fair coronet
 And by the well-scarr'd cheek
 They knew Affonso the adored,
 The victor of Ourique.

"This day"—thus spake the royal form,
 And the brethren held their breath—
 "This day Don John at Ceuta
 Must strike for life or death;
 Yet let each heart be joyous,
 Yet let each heart be bright,
 I and my son Don Sancho
 Are going to the fight!"

That very hour at Ceuta
 Two kingly forms were seen,
 Mounted on steeds as white as snow
 Of more than mortal mien:
 No word they spake, no stroke they strake,
 As they charged the Moorish rank;
 Yet evermore, where their steeds passed o'er,
 Th' accursed crescent sank.

Coimbra is connected with Portuguese history by another romantic incident. Crossing the Mondego river we come to the Quinta das Lagrimas, which I may translate as "The Garden of Tears." In this garden, shaded by ancient trees, is a spring called the Fonte dos Amores—the Lovers' Fountain.

Inez de Castro was the daughter of a Spanish nobleman who, in the fourteenth century, took refuge at Coimbra from the tyranny of his own government. Now Inez was good and beautiful, and the Infante, afterwards Dom Pedro I., fell deeply in love with her. Inez de Castro was placed in the not far distant Convent of Santa Clara. The convent received its water by means of a conduit from this spring, which Dom Pedro utilised as a means of communication. He attached his letters to pieces of cork, and they were thus carried into the convent precincts.

We took a photograph of the old Convent of Santa Clara at Coimbra. At that time great jealousy existed between the Portuguese and Spanish courts, and Dom Pedro's attachment to Inez de Castro was regarded with hatred.

The lovers therefore were secretly married, and lived happily until, after the lapse of a few years, the courtiers persuaded the king, her father-in-law, to consent to the death of Inez. To this end the king came to Coimbra during the absence of his son, Dom Pedro, on a hunting expedition; but, touched by the tears and beauty of Inez de Castro, and the prayers of her children, the king left her without carrying out his resolution. The three knights who accompanied him upbraided him for his vacillation, and, having wrung from him a reluctant permission, murdered their victim almost before his eyes on the 7th of January, 1355. The body of poor Inez was buried in this convent.

The distracted fury of Dom Pedro knew no bounds. He made war upon the king his father, and laid waste the Minho province. On his accession to the throne, seven years later, Dom Pedro I., surnamed "The Severe" or "The Cruel," tortured two of the knights who did the fell deed to death; the third escaped. Dom Pedro caused the body of Inez to be disinterred, to be clad in royal robes, and to be crowned, side by side, with himself. Let me recommend to your notice Mrs. Hemans' striking poem on the Coronation of Inez de Castro. With your permission I will quote a few stanzas—

Why pass'd a faint cold shuddering
Over each martial frame,
As one by one to touch that hand
Noble and leader came?
Was not the settled aspect fair?
Did not a queenly grace
Under the parted ebon hair
Sit on the pale still face?

Death ! death ! canst thou be lovely
 Unto the eye of life ?
 Is not each pulse of the quick high breast
 With thy cold mien at strife ?
 It was a strange and fearful sight
 The crown upon that head,
 The glorious robes, and the blaze of light,
 All gathered round the dead !

Alas ! the crown, the sceptre,
 The treasures of the earth,
 And the priceless love that pour'd those gifts,
 Alike of wasted worth !
 The rites are closed : bear back the dead
 Unto the chamber deep !
 Lay down again the royal head
 Dust with the dust to sleep !

We shall find the last resting-place of these faithful lovers at Alcobaça.

Our journey southward now brings us to Leiria, a pleasant town of some 3,000 inhabitants, nestling under a precipice upon which stands a castle still in fair preservation. It was founded by Afonso Henriques upon the site of one taken by him from the Moors in 1135. This castle of Leiria has been compared to the castles which so picturesquely overhang the Rhine and the Danube. There is a good hotel at Leiria, and it is a convenient point from which to visit the glorious monastery of Batalha.

In fulfilment of a vow, Dom João I. founded, in 1387, a monastery as a thank-offering for his decisive victory over the Castilians on this spot. The Dominicans persuaded him to appropriate it to their order, and it was called the "Mosteiro Real de Santa Maria da Victoria"—the "Royal Monastery of the Holy Mary of Victory." It is more frequently known by the simple name of Batalha. It is sometimes called the Battle Abbey of Portugal. The west façade is very beautiful.

The monastery is the most beautiful ecclesiastical building in Portugal. It is built of a hard limestone resembling Carrara marble. A profusion of spires, pinnacles, pierced battlements, and flying buttresses go to make up the design. The style of architecture is described as "Modern Norman Gothic, with an occasional dash of Arabian intermixed," which is suggestive of the firm grasp of Portugal which the Moors maintained for several centuries. The west door is a most elaborate work. It has no less than a hundred beautifully-carved figures, each on its own pedestal, and under its own canopy, but the scale of the building is so great that at a small distance we cannot see the figures in detail. On the right is the Capella do Fundador—Chapel of the Founder—a royal mausoleum ; the lantern of the chapel was originally capped by a spire, but this was destroyed in the great earthquake. We entered the nave by the great door, and then through the door on the left passed into the

cloisters. On entering the nave we were struck by its lofty proportions; it is 90ft. in height from the floor to the apex of the groined roof.

The first architect of Batalha is said to have been one Affonso Domingues, but some authorities say that the architect was an Irish monk; others that he was one Stephen Stephenson, an Englishman; others that the oldest parts of the fabric were built by the Freemasons. The truth is that the name of the architect is lost.

Unlike most Portuguese churches, the nave has neither side chapels nor altars, in this respect being more in accordance with the English practice. This may possibly be owing, in some degree, to the taste of Philippa of Lancaster, queen of the founder, who, it is recorded, was consulted in the building of this monastery of Batalha, and we English people may perhaps indulge a slight feeling of pride at the thought that the influence of our country-woman all those years ago was felt in this, one of Portugal's noblest works.

We look from the nave into the Capella do Fundador—the Founder's Chapel—in itself a beautiful architectural work. It is square, each side 66ft. in length. In the centre is the high tomb of the founder, who died in 1434. On it repose the effigies of Dom João I. and Donna Philippa, the queen holding her husband's right hand in her left. The figures are colossal, for they are more than life size. The tomb is so high that a ladder is required to see the figures, and it is worthy of note that the date of the epitaphs is exactly that of the period when it was commenced to compute time by the years of our Lord, instead of by the era of Cesar.

Round the sides of the chapel are the tombs of the sons of Dom João and Philippa; among them that of their third surviving son, Prince Henry, "the Navigator," whose enterprise and liberality led to so much success in maritime discovery, and did so much for the prosperity of Portugal.

From this you will see that the monastery of Batalha was built during the heroic age of Portuguese history, when, as a writer expresses it, "the East just opened out by Vasco da Gama, and the West just discovered by Columbus were already pouring wealth into the treasuries of Spain and Portugal."

The architect, then, was allowed to give free scope to his artistic genius, with hand unrestrained on the score of expense. One result of this you see in the exceeding beauty of these cloisters of Batalha. The cloisters are square, each side 180ft. long. In the angle of the cloisters is enclosed a very elegant fountain, which, as the refectory was on that side of the building, served the monks for washing their hands before or after meat.

These cloisters have been described as fairy-like, from the fertility of invention of pattern in the windows, and the elaborate

execution of intricate design. There are twenty-eight windows, no two of them exactly alike. The tracery is sometimes wrought in mere foliage without any figure, sometimes arranged in bands and circles round a cross, some voluted, some filleted, in some strange lizards are twisting in and out amongst foliage, some have the effect at a distance as if made of cotton wool. The arch, examined in detail, has peculiarly that effect. It is a tracery of fir-cones carried on pillars—some carved spirally, others in a diamond pattern. The whole work is most carefully and delicately executed. When we entered the cloisters we got a better idea of their length of 60 yards. The monks were able to get a walk of 240 yards round their cloisters without exposure to the weather. The cloisters are very lofty.

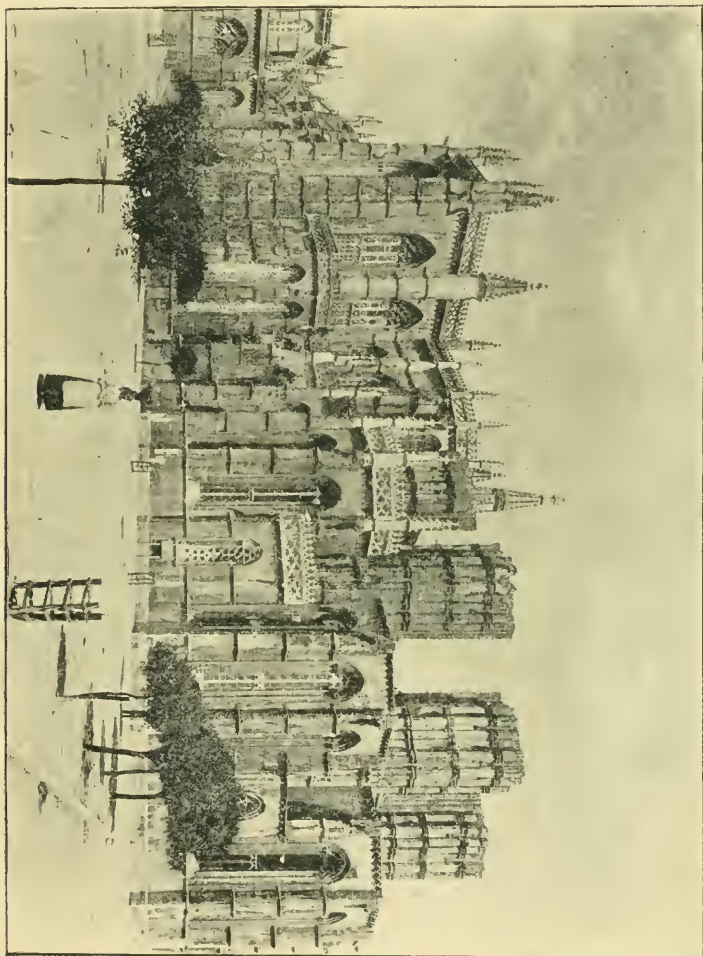
The king, among other things, gave annually 43 pipes of wine and 215 dozen of fish for the use of the fathers, and commanded that they should say masses for the souls of himself and the queen his wife. He also commanded that for the necessary repairs of the monastery there should be a staff of 125 stonecutters, 56 quarrymen, 20 carters, 10 labourers, 1 smith, and only 2 carpenters. Wood was to be used only for the doors.

We now passed to the south-east side of this splendid monastery, and we understood better the extent of the church. We visited the Founder's Chapel, the nave, and the cloisters. Those we may term the perfect and complete parts of the building; but there is an uncompleted portion at the east end of the church. It is called the *Capella Imperfeita*—the "Unfinished Chapel." The tall pillars have, as it were, stopped short in their growth. This unfinished chapel is by many artistic persons considered the gem of the whole monastery.

Dom Manoel, well named the "Fortunate," and, probably, in his time the most opulent monarch in Europe—owing to the discoveries of Vasco da Gama in the East and of Pedro Alvares Cabral in the West—conceived the idea of imitating Henry VII.'s Chapel at Westminster, and, as a mausoleum for himself, commenced the building of this chapel—never finished.

The chapel is an octagon in form. Each of the eight sides is designed as a smaller chapel for a royal tomb, and each of these eight sub-chapels has a thirteen foiled and refoiled arch of entrance. But the glory of this unfinished chapel is the western doorway, by many authorities said to surpass anything else at Batalha. The doorway is 31ft. high and 32ft. wide at the splay, diminishing down through the ornamentation to an aperture of 15ft.

The ornamentation is so rich and lavish that it is impossible to form an adequate idea of it from the photograph or from any description of mine. Suffice it, then, to mention one bit of the carving. It represents one of the fathers of the church, and is



VIEW OF CHURCH OF MONASTERY OF BATALHA (see page 246).
From Photograph by Mr. E. W. Mellor, J.P., F.R.G.S., F.I.Inst.

only 12in. high, yet the sculptor has managed to give its tunic an appearance of having been worn threadbare. This gorgeous chapel, so nobly designed, had advanced to its present condition when the architect, Mattheus Fernandes, died on the 10th April, 1515. He is buried in the church. Fernandes left no working drawings behind him, and the design for the completion was left to his son, who began by erecting two heavy Grecian arches on the west side of the clerestory stage, with a vulgar balustrade beneath. We now mounted up to these arches.

Dom Manoel, visiting the works, was so disgusted that he ordered them to be stopped, and from that day, for nearly 400 years, this Capella Imperfeita has remained a fragment so exquisite that no one has ventured to attempt its completion.

Through these arches we saw two of the unfinished columns which we saw from below. The niches were intended for statues, and in the delicate carving there is a frequent repetition of the initials M and R—Manoel Rei—Manoel King.

One is apt to think that in the Middle Ages the world was little better than semi-barbarous; but this beautiful monastery rebukes the thought, and clearly demonstrates the high pitch of civilisation and artistic skill to which those ages had attained.

We must not linger at Batalha, but continue our journey southward. At the junction of the two small rivers, Alcoa and Baça, stands Alcobaca, a small town of 1,500 inhabitants. Affonso Henriques, when passing here on his way to the siege of Santarem, vowed that, if successful, he would build a monastery on this spot. Returning victorious he sent to St. Bernard for some monks, and with them commenced building in fulfilment of his vow. Affonso began digging the foundation with his own hands in 1148, and the monastery was finished 74 years later. The west front of the monastery church is grand. This monastery of Alcobaca is the largest in Portugal, perhaps in Europe.

Batalha accommodated 40 monks, but this monastery of Alcobaca accommodated 1,000 monks; by some strange chance, however, their number never exceeded 999. This large community dwelt here for many generations, greatly to the advantage of the neighbouring villagers and country people.

Since the suppression of the monasteries, the conventual buildings, extending right and left of this church, have been converted into a huge cavalry barracks, and the cloisters, which are of great length, are now simply a series of stables; and very odd it appeared to me to see the troopers grooming their horses in these old monkish resorts. The Peninsular war is chiefly to be thanked for this; the French destroyed the barracks, and, as a consequence, the Portuguese military authorities adapted the monasteries to this purpose. This church, then, is the only

part of the great monastery of Alcobaça which we can enter with freedom.

The old monks of the Bernardine order at Alcobaça enjoyed immense revenues; they were all men of gentle birth; they were seldom seen abroad on foot, but rode on excellent mules.

The shrine of St. Bernard, in the church, well repays close examination. It represents the saint on his death-bed, surrounded by weeping monks, whose heads, you notice, are nearly all missing. This piece of wanton mutilation was done by the invading French soldiery during the war. Above is the apotheosis of the saint, who is accompanied by a choir and musicians of angels. There is an angel with an organ, another with a mandolin, another with a bassoon, one with a guitar, two with the Portuguese bandolin, and high up on the right an angel playing a violin.

The objects of greatest interest in this church of Alcobaça are the tombs of Dom Pedro the severe and Inez de Castro. You will remember that we heard of the sad fate of Inez at Coimbra, and how Dom Pedro, her husband, when he succeeded to the throne, had her body disinterred and crowned in solemn pomp. Dom Pedro expressly commanded that at his death his tomb and that of Inez de Castro should be placed foot to foot in order that "at the resurrection the first object that should meet his eyes might be the form of his beloved Inez." This foot to foot position is contrary to the almost universal rule, but the idea is very romantic. The tombs are ornamented with the most exquisite carving, that on the tomb of Inez representing incidents in the life of Christ.

The French opened these tombs in search of imagined jewels and treasure. The bodies of the royal pair were dragged from their resting-place. Dom Pedro, it is said, retained the severe expression which never forsook his face after the cruel murder which made him homeless. Dona Inez was still lovely in death, her auburn hair uninjured until disturbed by desecrating hands. The monks collected the scattered hair, and reverently replaced it, with the body of Inez, in the tomb. The French endeavoured to destroy the monastery; they did set it on fire, but before they could carry out the work of destruction they had to retreat before the advancing English and Portuguese army.

Still moving southward we come to Torres Vedras, a town which for six centuries was the chief of those which formed the jointure of the queens of Portugal. They frequently took up their residence in the castle, which we see from the photograph is now a crumbling ruin. It was a stronghold of the Moors, but Affonso Henriques wrested it from them in the twelfth century.

The most interesting memory connected with Torres Vedras to us Englishmen is the fact that this place gave its name to

those lines of fortifications which the talent of the Duke of Wellington organised for the defence of Lisbon, and which I described to you upon the map at the outset. We can imagine, I think, the Iron Duke climbing this castle hill of Torres Vedras to scan the landscape o'er with the keen eye of a strategist. Napier tells us that Wellington was impelled to the greater energy in the construction of the lines of Torres Vedras because he realised that if the British were beaten, or driven by the French to embark, the miserable ruined Portuguese must submit without further struggle. We took a view from the castle, but from it we were not able to form any just conception of those fortifications of 80 years ago.

In the far distance is a bull ring, a circular building for bull fights. In this locality there is a hot spring said to be an unfailing remedy for rheumatic gout. There are abundant hot springs and mineral baths in Portugal. We visited one of the most celebrated of these places at Vizella, in the north. In Torres Vedras is an old Moorish fountain. The well is contained within an octagonal building, which is so constructed that the sun, which here is of great power, is said never to shine upon the water. Behind one of the pinnacles, we saw that somewhat rare sight in Portugal—a house chimney. This one is that of a large kitchen or bakery.

In all the Portuguese towns water for the domestic supply is carried from wells and fountains. This fountain is Moorish, and it is worthy of remark that another trace of the Moorish occupation is seen in the Portuguese word for fountain. It is the Moorish "*chefariz*."

We now visited a monastery of some four or five hundred years later date than those we have seen. Dom João V. made a vow to St. Anthony that if that saint would intercede with the Almighty that a male heir to his throne should be vouchsafed to him, he, the king, would change the poorest monastery in his dominions into the most magnificent. In due time a boy was born to the king, and this monastery was built. The king's agents found a community of twelve poor Franciscan friars at Mafra, and in 1717 was laid the foundation-stone of this enormous building, which consists of a palace and convent combined.

The great quadrangular building is in imitation of the Spanish Escorial, and it has a frontage of about 800ft. The monastic part of the building is used as a soldiers' barracks, but the royal residence, or palace part of the building, is empty. The roof of this enormous pile of building forms one immense terrace so vast that it is said ten thousand men might be reviewed on that great platform. The towers are 350ft. high, *i.e.*, about two 60 yard factory chimneys one on the top of the other. The cost of the bells, chimes, and clocks was so great that the Dutch

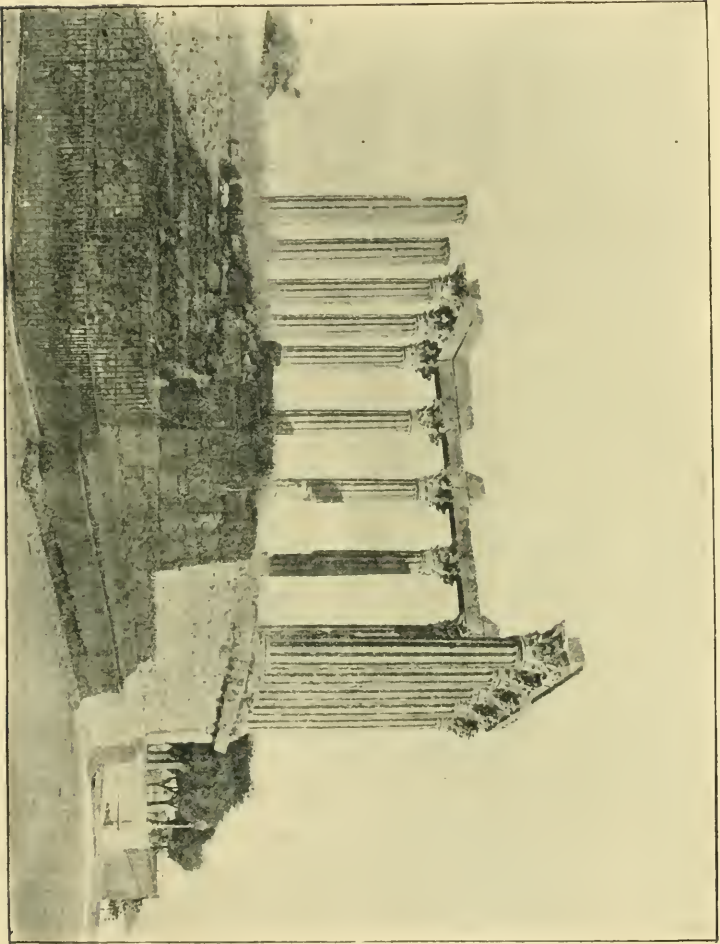
makers declined to execute the order, fearing that Portugal was too poor a country to pay for them. The king replied by ordering twice the number and by sending money to pay for them beforehand. The weight of metal in each tower is reckoned at 200 tons.

Ascending a noble flight of marble steps we enter the portico of the church, which contains figures of saints exquisitely sculptured. Speaking of this portico and the church, Lady Jackson says: "The magnificence of the coloured and polished marbles, the porphyry and mosaics of the floors, the ceilings, the pillars, the walls, is dazzling, bewildering." The architect was one Frerico Ludovici, said to be a German, though his name suggests Italian origin. All the different varieties of marble used come from local or native quarries. I was here on a saint's day, and found a man preparing to celebrate it by fixing sky-rockets to a bundle of sticks to fire off in the evening.

You may better, perhaps, estimate the extent of this great palace convent of Mafra when I tell you that it contains 5,200 doors, 9 courts, and 866 rooms, in one of which we now find ourselves—the library. The library is 300ft. long. The floor is paved with pink and white marble, the roof is stuccoed, and the bookcases are made of the richest wood. There are here about 30,000 volumes and many valuable MSS. There is also a rare and celebrated botanical work, with excellent coloured plates, written in 1673 by one Van Reedes.

There is one other room at Mafra which was of great interest to me. It is a room containing a vast number of old brass lamps, which were formerly in use in the convent. We saw a large lamp, which was one of those suspended in the church. Some on three feet were table lamps; and some lamps on tall stems, with a curved arm carrying a reflector, were reading lamps used by the monks in their cells.

We next went to Evora, quite in the south-east of Portugal, where there are the most perfect remains of the dominion of ancient Rome existing in the country. It is a portion of the temple erected here to the goddess Diana about 80 years before Christ, by Quintus Sertorius, who was then governor here. Shortly after the erection of this temple Julius Cæsar conferred many privileges upon Evora. Murphy, the architect, describes the temple thus: "The front represents a hexastyle in the Corinthian order. The diameter of the columns is 3ft. 4in. The base is Attic, a semi-diameter of the column. For proportion and delicacy of sculpture the capitals are much to be admired. The entablature is entirely destroyed, except part of the first fascia of the architrave; the rest of the work is in a degree of preservation scarcely credible in a monument of its age." The temple is upwards of 1,900 years old. The wall, too, is part of the old Roman building.



THE TEMPLE OF DIANA, AT EYORA (see page 250).

From a Photograph by Mr. E. W. Mellor, J.P., F.R.G.S., F.Inst.

Until 1834 the Temple of Diana was used as a slaughter-house; since then the authorities have had regard to the proper preservation of this relic of ancient Roman splendour. Now-a-days Evora is the centre of the cork industry, and is surrounded by long straggling cork forests.

Moving now westwards towards the sea we find ourselves in this photograph in the principal street of Setubal, a town of 20,000 inhabitants, 16 miles south of Lisbon. Setubal is an ancient town. Some antiquarians say that it was founded by Tubal 2,000 years before Christ; but this is not sufficiently proved. Certain it is, however, that the Romans and Moors were here. The best oranges in Portugal are grown round about Setubal, and its chief industries are the packing of oranges and sardines for shipment. The men washed the wine casks at the "chegariz," or fountain. The houses are innocent of chimneys, excepting, perhaps, one.

We now approached Lisbon, by way of Cintra, and the first object that attracted our attention on leaving the railway at Cintra is the *Palacio Real*. This old royal palace was the Portuguese *Alhambra* of the Moorish kings. During the lapse of centuries succeeding kings have restored and rebuilt it, and to-day it presents this curious mixture of Moorish and Christian architecture. The old Moorish kitchen is intact. It is of immense size, and these two great conical chimneys are its only roof. These two huge cavernous vaults over the kitchen give it an extraordinary echo.

Here were spent the bridal days of Philippa of Lancaster, queen of Dom João I. We saw their tomb, you remember, in the Founder's Chapel at Batalha. One day, it is said, Philippa caught her royal spouse bestowing a rose and a kiss upon one of her maids of honour. The king immediately said, "E por bem, minha Senhora" ("Platonic, my lady!" or "For the good of the thing!") Of course the court chattered like magpies over the incident, and to silence their gossip the king had one of the ceilings of this palace painted with an immense number of magpies each holding in its claw a rose, and in its beak the motto, "Por Bem." I think we may quote a parallel in our royal motto, "Honi soit qui mal y pense." I saw this strange ceiling, which to-day is somewhat injured by the effacing hand of time.

Cintra lies at the foot of the lofty Pena rock. On its summit Dom Manoel built a convent, from the tower of which he used frequently to scan the sea, watching for the return of Vasco da Gama's fleet from the voyage which discovered India.

Some fifty or sixty years ago the disused convent was purchased by Dom Fernando, who converted it into the celebrated Palace of the Rock—the "*Castello da Pena*"—and of this you have a distant view from the road below. I could not obtain permission to photograph it from a near point, owing to the

abuse of a previous permission by some foolish individual, which is to be regretted.

The ascent of the rock is generally made on donkeys; in fact, in Cintra donkeys are used for everything. Families move about on donkeys; so do their goods and chattels. One day I saw gravely riding into Cintra a woman and a lad, sitting back to back on a donkey—the woman facing the donkey's head and the lad its tail. The trees conceal the precipice-like appearance of the rock, which, with its castle convent, suggested to Lord Byron the lines—

The horrid crags, by toppling convent crowned ;
 The cork trees hoar that clothe the shaggy steep ;
 The mountain moss by scorching skies imbrowned ;
 The sunken glen, whose sunless shrubs must weep ;
 The tender azure of the unruffled deep ;
 The orange tints that gild the greenest bough ;
 The torrents that from cliff to valley leap ;
 The vine on high, the willow branch below,
 Mixed in one mighty scene, with varied beauty glow.

There is a little cascade which falls down the rocks into a pool, dark and cool under the leafy shade. This is at a spot by the roadside, facing the walls of the Montserrat-Quinta at Cintra, which name is derived from Mons Cynthiæ—"Mountain of the Moon." Here we may well realise Milton's words—

And overhead upgrew,
 Insuperable height of loftiest shade,
 Cedar and pine, and fir, and branching palm,
 A sylvan scene ; and as the ranks ascend
 Shade above shade, a woody theatre
 Of stateliest view.

Following the Pena rock for some miles out of Cintra, the roadway loses itself on a bleak moor. Then, guided by a series of crosses placed at intervals, we arrived at a very remarkable spot. It is a hermitage for twenty Franciscan monks of the severest order. Their cells, excavated out of the rock, are about 5ft. square. In order to exclude damp the cells are lined with cork. From this it is called the Cork Convent. In the refectory is a table, which is the bare rock walled round and roofed in; behind it is the kitchen, of which a window-like structure is the chimney, and there are eight openings as exits for the smoke.

One of the hermits, the "blessed Honorius," descending one day into the valley met a beautiful girl, who begged the holy father to confess her. He refused, and told her to go to the convent if she desired to confess, but she entreated him to confess her there and then. Honorius, remarking the beauty of the suppliant, consented, but his conscience pricked him for being influenced by so so worldly a thing as the beauty of a woman. He made the sign of a cross, and repeated a pater

noster. Immediately the girl fled, and Honorius realised that he had seen the devil in that attractive form. As a penance he condemned himself to live the rest of his life—and he lived to be 95—in a cave hardly larger than a coffin, and in which he could not even lie straight.

We now reach the last stage of our journey—Lisbon, the capital of Portugal.

Lisbon is one of the most ancient seaports in Europe—indeed, its history dates back to so remote a period that it is said to have been founded by Homer's great hero of exploration, Ulysses. His town was named Olisipio. This was corrupted down, or abbreviated, to Lispo! The Moorish conquerors changed the "Lispo" to Lisboa, because it is said there is no letter "p" in the Moorish alphabet. In Portuguese the name of the capital continues Lisboa, but in English and French it is Lisbon.

The Tagus, at Lisbon, is of immense width, making one of the finest harbours in the world. If we arrive at Lisbon by boat, on ascending the quay stairs we find ourselves in a large square—one of the largest squares in Europe—the Praça do Commercio, or, as it has been called by the English from the bronze equestrian statue, "Black Horse Square." This square was the scene of the greatest destruction of human life in the terrible earthquake at Lisbon on the 1st of November, 1755.

Let me for a moment recall that scene to you: A bright, sun-shiny morning. The inhabitants were commencing their everyday occupations. Suddenly, about nine o'clock, a strange, loud, rumbling was heard, as of thunder in the bowels of the earth. The ground rocked violently, and, for safety from the falling houses, the people fled into this great open square. It became one dense mass of agitated humanity. Then, to quote Lady Jackson, "the sun was obscured, the sky became livid, a tempestuous wind arose and filled the air with clouds of black dust, and the Tagus heaved and foamed like a stormy sea. Again, one long terrible moan—the ground is torn asunder, and, amidst shrieks of anguish that rise to heaven above the awful roaring of the heaving earth, down together into the abyss sink the rich and poor, the aged and the young, the mother and her babes; palaces, churches, monasteries, public buildings, all disappear, and the ground closes over them." In the space of twenty minutes a city was destroyed and more than 15,000 persons perished. It was a calamity "unequalled by any similar one since the destruction of Pompeii and Herculaneum." The present modern buildings are, therefore, built over the buried city.

Great energy was shown by the King, Dom José I., and his prime minister, the Marquis of Pombal, in rebuilding the city; and the inhabitants in 1775 erected this equestrian statue to

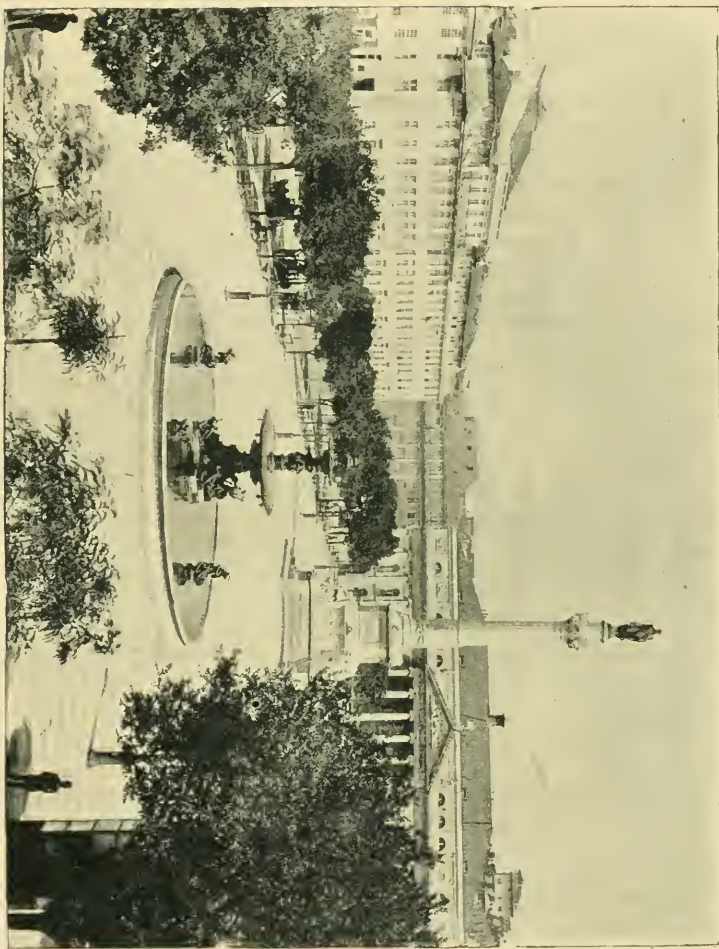
the king in gratitude. On the opposite side are the buildings of the Portuguese Home Office and other Government departments.

There are in Lisbon the ruins of a church, the Carmo, still much in the same condition as they were left by the earthquake. The tall pillars, and light delicate-looking arches are still standing—high testimony of the mechanical strength of the arch, which must have been sorely tested in so terrible a shock. The priests were performing mass when the falling roof, heaving floor, and tottering walls interrupted their devotions. This beautiful ruin was close by my hotel at Lisbon, and as I watched the busy throng in the street I could not help an involuntary shudder, as these broken pillars and arches brought home to me the appalling nature of that great earthquake.

We now have another of the Lisbon squares, the Largo do Pelourinho—the “Square of the Pillar,” which you see stands in the centre of the square. It is a spiral column, exquisitely carved from a single block of marble. It is surmounted by an armillary sphere, the significance of which, “Half the world is mine,” I explained to you at Braga. A “pelourinho,” in addition, signifies a pillar set up in the principal place of a city to symbolise municipal rights. On this spot “fidalgos,” members of the upper class, who were condemned to death, were formerly executed. And before Dom Pedro ordered this armillary sphere to be placed on the pillar it was crowned with iron spikes to carry the heads of those executed, such as we saw at Villa do Condé.

Opposite is the Camera Municipal, or Town Hall. The Avenida is the principal boulevard of Lisbon—its Bois de Boulogne or Rotten Row. The Avenida is about a mile long, and therefore makes a good ride or promenade. The royal family drive here nearly every day. There is an obelisk, which is 100ft. in height, and which was erected in memory of the Revolution of 1640, and in gilt letters on the sides of the obelisk are the names of nearly all the battles in which the Portuguese armies have fought.

A walk of five minutes takes us from the Avenida into the principal square of Lisbon, called the Praça de Dom Pedro IV. It takes its name from the statue of Dom Pedro IV. carried on the top of this lofty marble column. The square is more commonly known as the Rocio. On three sides of the square there are shops, but at the north end stands the theatre of Donna Maria II., erected by that queen in 1847. Maria II. was the daughter of Pedro IV. He resigned the Portuguese crown to her in 1826 while he remained Emperor of Brazil. The pavement of the square is set in wavy lines of white and dark stone, such as we saw in the principal square at Oporto, and, like that square, this Rocio has, from these wavy lines, been called



VIEW OF THE PRACA DE DOM PEDRO IV., AT LISBON (see page 254).
From a photograph by Mr. E. W. Mellor, J.P., F.R.G.S., F.Inst.

"Rolling-motion Square." Some English sailors, trying to improve on this, have dubbed it "Rolley-Polley Square."

Not far from the Rocio is a small square containing a statue. It is the statue of Portugal's greatest poet, Luis de Camoens. During his lifetime he seemed to be pursued by ill-luck, and twice he had to fly from the country, but his name will be ever famous for the great epic, in which he sings of the adventures of Vasco da Gama on that eventful voyage which discovered India. Camoens' great poem, the *Lusiad*, has been Englished, to use his own term, by Sir Richard Burton, the traveller. Burton thus describes Camoens: "An out-spoken, truth-telling, lucre-despising writer; a public servant whose motto was, strange to say, honour not honours; a doughty sword, and yet a doughtier pen; a type of a chivalrous age." The pedestal of this bronze statue of Camoens is surrounded by eight smaller figures of the discoverers mentioned by the poet in the *Lusiad*. The trees in the Praça are "pimenteiros," or pepper trees.

Vasco da Gama and his little adventurous band, before they sailed, in 1497, on that memorable two years' voyage of enterprise, peril, and endurance, which resulted in the discovery of India, and compared with which one writer says, "the discovery of America by Christopher Columbus was only a pleasure trip," spent the entire previous night in prayer in the small chapel which Prince Henry the Navigator had erected for the benefit of sailors by the shore of the Tagus, about two miles below Lisbon, a convenient point for embarkation.

When at length they returned to the same spot, King Manoel, "the fortunate," devoted the first treasure brought from India to the erection of a magnificent church and monastery as a thank-offering. From a photograph of the west-door, and as a measure of size, we noticed the girl sitting on the steps, that some of the statues in the niches are life-size. Manoel dedicated the church to St. Jerome, and this spot he named "Belem," signifying Bethlehem, now a populous suburb, the west end of Lisbon. This memorial church of four hundred years ago is therefore known as the *São Jeronymo* of Belem. The more generally used entrance to the church is the south-door. Fergusson says that this porch is "wholly in the style of the early years of the 16th century, and as elaborate an example of the exuberant ornamentation of that age as can be found in the peninsula."

There are here no less than thirty statues, but the one in the centre of the doorway possesses the greatest interest for us. It is the statue of Prince Henry the Navigator, the son of João I. and Philippa of England, to whose influence and liberality the great maritime discoveries of Portugal are so largely due. Passing through this door we enter the nave of *St. Jeronymo*. Mrs. Champney says: "Tall, richly-wrought columns shoot up-

ward, supporting the vaulted roof, which is so delicately groined that the immense mass of stone has all the apparent lightness and feathery spring of the reticulation of a palm leaf."

It is related that when the scaffolding was removed the groined roof fell in and killed a number of the workmen; when the roof was re-erected, the architect, who was severely criticised, fearing a similar disaster, fled into France. On this, Dom Manoel ordered that the scaffolding should be removed by criminals under sentence of death, promising a free pardon to those who should survive the result. The scaffolding was taken down, and was used by the liberated felons for building dwellings for themselves, and, as Mrs. Champney says, "contrary to all expectation, the roof rested securely upon its slender piers, and the storms of four centuries and the shock of more than one earthquake have not thrown it from its delicate poise."

The remains of that courageous mariner, Vasco da Gama, lie in this church just where we were standing. Passing through the north wall we enter the cloisters. The cloisters of St. Jeronymo are some of the most lovely that any abbey can boast, second only, perhaps, to those which we saw at Batalha. These cloisters are, of course, a quadrangle, and we notice that they are in two storeys. According to Mrs. Champney, they form "a frame, or rather a richly-wrought jewel-box to the flower gems of the central parterre."

Of late years the conventual buildings at Belem have been converted into a "Real Cassa Pia," or Royal Orphanage, for upwards of 500 boys, the largest charitable institution of the kind in Portugal. I saw the boys marshalled in this cloistered corridor, and marched like a regiment of small soldiers off to dinner. In a few minutes, as I stood there adjusting my camera, there came from the old refectory the continuous rattle of knives and forks. That small battalion had evidently fallen to with a will.

If we now examine more closely the detail of the upper cloister, the first impression is one of astonishment, and this is succeeded by one of admiration. The style of architecture is described as the flamboyant later "Norman Gothic," showing a tendency towards over ornamentation, and yet the whole is in good taste. The material used is a hard close-grained white limestone found in the neighbourhood, which, by the mellowing action of centuries, is now of a rich brown hue.

We now descended to the garden, and there examined one of the ground-floor cloister arches. So delicate and exquisite is the tracery, so well-proportioned the arches, so elaborate the finish of the details, that they may be truly described as wonderful. The architect was an Italian named Potassi. When he found that the roof of the church would stand, Potassi returned from France, and received a pension from Dom Manoel.

This church and monastery at Belem was built with great rapidity. Dom Manoel withdrew the skilled artificers from Batalha and pushed them on with this work at Belem, and this probably explains in some measure the reason why the Capella Imperfeita at Batalha was never finished. Whether that is so or not we must agree that this magnificent pile of building at Belem is a worthy memorial of Vasco da Gama, one of the world's greatest discoverers.

At the same period, 400 years ago, Dom Manoel also built on the spot at Belem, from which Vasco da Gama embarked, the Torre de S. Vincente—the tower of St. Vincent, who, I may say in parenthesis, was the patron saint of Portugal. We found a picturesque old tower which was intended as a fort, and in its dungeons political prisoners were confined. The shields with which the battlements are faced are emblazoned with the great crosses of the Order of Christ.

The old tower of Belem is built partly in the river, and we looked down the Tagus towards the Atlantic. The quarantine station of Lisbon is across the river opposite this tower; the homeward-bound mail steamers, therefore, anchor off this tower, and here it was that I embarked on board the steamer which brought me home.

I venture to hope that you have found some interest and pleasure this evening in our tour through Portugal, the home of such heroes as Affonso Henriques, John I., Henry the Navigator, and Vasco da Gama—men whose achievements so fired the genius of Camoens that he sang their deeds in his famous *Lusiad*, that great epic poem which I have already mentioned.

Let me conclude by quoting the first two stanzas of the *Lusiad*, as translated by Sir Richard Burton, and you will notice that Camoens' opening is not unlike Virgil's opening of the *Æneid*, "*Arma virumque cano*":—

The feats of arms, and famed heroic host,
From Occidental Lusitanian strand,
Who o'er the waters ne'er by seamen crost,
Farèd beyond the Taprobáné land,
Forceful in perils and in battle post,
With more than promised force of mortal hand ;
And in the regions of a distant race
Rear'd a new throne so haught in Pride of Place.

And, eke, the kings of memory grand and glorious
Who bied them Holy Faith, and reign to spread,
Converting, conquering, and in lands notorious,
Africk and Asia, devastation made ;
Nor less the lieges who by deed memorious,
Brake from the doom that binds the vulgar dead ;
My song would sound o'er Earth's extremest part
Were mine the genius, mine the Poet's art.

CLIMATE AND THE GULF STREAM.*

Communicated by Mr. JACQUES W. REDWAY, F.R.G.S., Editor of Goldthwaite's

"Geographical Magazine," and read to the Members in the Library.

THE advent of warm weather brings each year a germinating period in which is developed a crop of theories, wise and otherwise, concerning the relations between the weather and the Gulf Stream. Just which is a cause and which is an effect does not always seem to be clear in the minds of the writers. Those who theorize about the weather usually charge its vagaries to some abnormal condition of the Gulf Stream, while the sages of the latter commonly credit many of its alleged eccentricities to the weather. That there may be mutual relations of cause and effect between the two is by no means uncertain; indeed, it is highly probable. But the assertions that the hot and moist summers, the unusually warm winters, and the excessive floods of the past few years are impartially due to this ocean current—all of which statements have appeared time after time in reputable journals—are propositions that have not been established by evidence.

In order to understand better what may be the relation between the vagaries of the weather and warm ocean currents, let us first consider what recent investigations have developed concerning the Gulf Stream. I say "recent" because, in the light of past literature, it is doubtful if any other physical feature of the ocean has been more persistently misinterpreted than this one. It has heretofore been regarded as one of the most unassailable principles that the bed and banks of this current are "the cooler littoral waters of the western Atlantic shore." This statement is untrue so far as the bed of the current is concerned, for throughout about five hundred miles of its course its volume reaches to the bottom, even at depths exceeding four hundred fathoms. Indeed, it has swept the skeletons of certain organisms from the Caribbean Sea as far north as Cape Hatteras. Hitherto it has been held that the whole force of the current enters the Gulf of Mexico and makes a complete circuit of it; hence the name, the "Gulf" Stream. This has always been one of the chief tenets of hydrographic orthodoxy, and to demonstrate the reasons therefor has been one of the delights of the teacher of physical geography. But this most precious of theories has been discredited by Bache, Bartlett, Hilgard, and others, who have shown by careful surveys that little if any of the stream enters the Gulf of Mexico, and that on the contrary, the whole force of the current passes through Florida Straits. Another pet theory, the explanation of which has been the object of more than one treatise, is that of the ameliorating effect of the Gulf Stream on the climate of Europe. Even to this day, charts frequently display the current in question extending its arms and branches like a gigantic octopus, reaching into every strait, estuary, and arm of the sea, or else battering in a most formidable manner against impenetrable coasts. This wholesale laving of the shores of western Europe was asserted to cause, in that part of the continent, the mild temperature that stands in such strong contrast to that of the inhospitable, ice-bound coast of Labrador. The theory is certainly very interesting, but unfortunately there are no facts to bear it

* Printed in the *Forum* for October, 1890.

out. No part of the Gulf Stream is known to reach the shores of Europe. The warm, moisture-laden winds from the south-west, bearing heat made latent by evaporation, liberate it in the form of sensible heat, when the moisture is again condensed. That some of this moisture comes from the drift of the Gulf Stream is doubtless true, but it is equally true that Europe could get on very comfortably without it.

As a definite current, the Gulf Stream has not nearly the extent with which common opinion credits it. Practically it begins in Florida Straits. Some of the water which goes to make up its flood emerges from the Caribbean Sea through the Channel of Yucatan; much of it flows to the northward of the West Indies, entering the straits through Santaren Channel; a certain but inconsiderable amount comes from the Gulf of Mexico. All these currents unite in Florida Straits, and their combined volume forms the Gulf Stream. Between Fowey Rock, of the east coast of Florida, and Gun Cay, a coral reef fifty miles to the eastward, the current has a maximum velocity of $5\frac{1}{2}$ knots an hour and a minimum of about $3\frac{1}{2}$ knots. South-east of Hatteras Shoals, at a point where the 2,000-fathom curve is nearest the coast, the velocity rarely exceeds $1\frac{1}{2}$ knots an hour; and at the southern limit of the Grand Banks, or even before the stream reaches that latitude, it ceases to exist as a surface current. Thenceforth it becomes merely a drift; that is, it no longer possesses energy of its own, but is an inert mass governed by the winds. Now an ocean current is one thing, and drift water is quite another. The true current is deep, extending in many instances several hundred fathoms below the surface; the drift is superficial. The current is tolerably constant as to direction and strength, or, if these vary, they vary systematically and periodically; the drift, on the other hand, is mainly remarkable for its absence of constancy, being moved hither and thither by the winds. So the Gulf Stream as a current may be said to begin at Florida Straits, and to end, so far as actual knowledge is concerned, somewhere near the Grand Banks; but the drift from the stream is pushed by the prevailing westerly winds, and is spread over the western part of the north Atlantic. What proportion of the surface water of the north-east Atlantic is the drift of the Gulf Stream, and what is the proportion that is pushed by the winds from other localities, is not known. Moreover, whatever warming power this drift may have is due not so much to its motion as to its condition of rest; for not until the drift has spread superficially over a great area, and has lost all motion except that caused by the winds and concurrent with them, can it impart its heat most advantageously to the air.

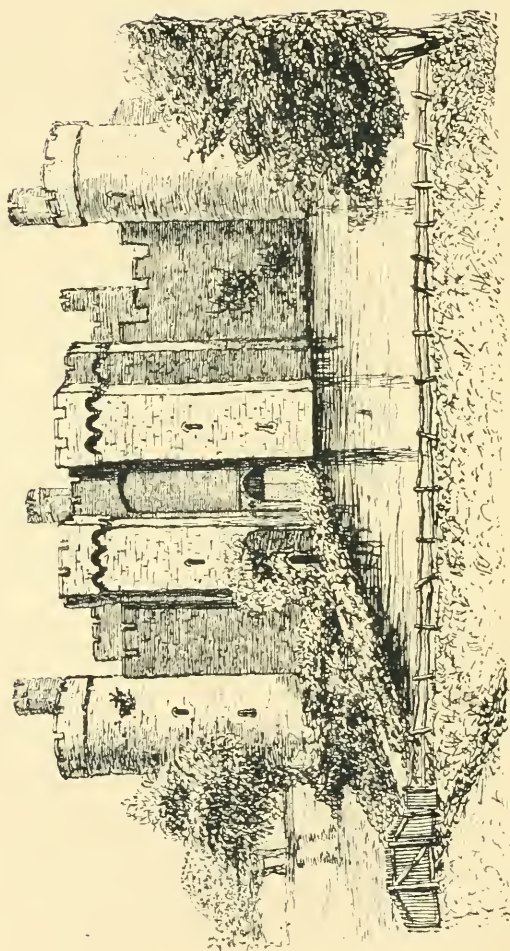
According to popular belief, high winds are accustomed to interfere sadly not only with the velocity and direction of the Gulf Stream, but also with its position. Lieutenant Pillsbury shows this to be untrue. An adverse wind may retard the velocity of the current, and a favourable one may accelerate it; but the change in either case is superficial. Even when an adverse wind is strong enough to throw the water into rips, the effect is not noticeable below a depth of three or four fathoms. A quartering wind, or one blowing directly across the current, has but little effect. It may blow a mass of colder water into the track of the stream, but otherwise the flow of the latter is undisturbed. It simply carries the accession of cold water with it, and an equal amount of stream water is pushed to one side. The Gulf Stream is much like any other current of water; it flows simply because its waters are not in a condition of equilibrium. Almost always its flood consists of warm water; but, like a river, it will carry anything that floats, and if a mass of colder water is pushed into its channel, it will carry that also. It is not safe to decide that the water at a certain place is not stream water simply because it is cold; and it does not necessarily follow that it is in the track of the stream because it happens to be warm, blue, and choppy. In the past

few years, the finding of patches of stream water, or rather of stream drift, closely packed against the eastern shores of the middle and north Atlantic States, has resulted in the sounding of a new alarm, namely, that the Gulf Stream has shifted to a position nearer the shore, and that, in consequence, our climate is undergoing a gradual change. That there have been changes in the axis, or line of maximum flow, during the past year, is true ; so there have been every year since the current has had an existence. The changes, however, are slight ; they are, moreover, systematic and periodic. There is a daily, a monthly, and a yearly variation in certain of the elements of the stream. The first and second are concurrent respectively with the daily passage of the moon and with its change ; the third, with the declination of the sun. Not only does the position of the axis oscillate, but the volume, velocity, and temperature are equally changeable. These things have been matters of speculation for many years. Lieutenant Pillsbury has shown them to be facts. But to say that any permanent or material change in the Gulf Stream has taken place in recent times, is an assertion that has not the slightest corroborative evidence. In long duration of time, it is possible that the precession of the equinoxes may affect the position and direction of the axis ; but such an assumption, although probable, is a question of theory and not of fact.

The reader of the foregoing paragraphs will perhaps conclude that our knowledge of the Gulf Stream is somewhat meagre. This is true. Fifteen or twenty years ago the descriptive treatises concerning it were much more readable than those of to-day. But the trouble was that speculation and fact were so mixed that no one could tell the one from the other. Hence, when the results obtained by precise measurements were substituted for rough estimates, learned and unlearned theories based upon almost everything but actual observation were very quietly and very quickly dropped. The first deep-sea sounding made with steel wire demonstrated that no trustworthy sounding had ever been made with heavy manilla rope. So, also, when Pillsbury's current meter first slipped down alongside the jack-stay, it was manifest that the wisest disposition of the observations made with the float would be to discard them.

And now a word or two about the influence of the Gulf Stream on American weather. So far as absolute knowledge about it is concerned, one might almost paraphrase the alleged chapter of Hakluyt on "Snakes in Iceland," and assert that it has no influence. But, for want of actual facts, let us look at certain possibilities and probabilities toward which research is now being turned. In the first place, there is a remarkable correspondence between the track of this current and the cyclones of the north Atlantic ; just, in fact, as there is between the track of the Kuro Siwo and the typhoons of the China coast. To say, however, that the north Atlantic cyclones are born of the Gulf Stream, is to make an assumption that is very premature. The coast cyclone, like any other area of low barometer, follows the line of least resistance ; so does the stream. But the records of the weather bureau show that during the summer months, when the current of the Gulf Stream is putting forth its greatest strength, the cyclones come most frequently ; and, moreover, that at this season their paths lie most closely along the track of the current. That the excess of moisture which hovers along the track of the stream may be the fuel to which the cyclone owes its energy, is neither impossible nor improbable ; but it has not yet been established with certainty.

There is still another way in which our coast weather may be decidedly affected by the flow of this current, namely, from the accumulation of its drift along the coast. Although it is shown beyond doubt that the current *per se* is but slightly affected by the wind, yet the warm water it normally bears may be blown about at



BODIAM CASTLE, SUSSEX.

To illustrate paper by Mr. J. C. Blake, F.R.G.S., F.I.Inst., on "A Holiday in Kent and Sussex," page 189.

random as drift. Ordinarily the prevailing westerly air currents carry this drift to the eastward, but such is by no means always the case. During the summer months there are not infrequently adverse winds that, impeding the flow of the stream, scatter its surface waters far and wide on either side of its track, filling the narrow sounds and estuaries, and spreading warm water from Cuba to Quoddy Head. When the northern limit of the north-east trades extends as high as the 34th parallel, such an accumulation of drift will very probably occur. Indeed, it has been known to happen, for stream water bears its characteristics on the surface. During the hot and excessively moist July of 1887, stream drift was almost heaped against our eastern shores. Now, the presence of so much abnormally warm water alongshore cannot fail to have an effect, though just what the effect is and how great it is, is not known. The evidence of mutual cause and effect is more than circumstantial, but data of tangible value are wanting. They can be gained only by the establishment of stations to the east coast and south-east, say at the Bermudas and the West Indies. Granting the connection of accumulated stream drift with coast weather, there is no reason why forecasts of certain conditions of weather may not in time be made with as much certainty as those of the storms which travel across the continent. To venture an assertion that future observations will prove the presence or absence of alongshore stream drift to be an important factor in the weather of the Atlantic slope of the United States is merely to express a personal opinion; but there can be no reasonable doubt that the field of research is an important one.

NOTICE OF NEW ATLAS.

THE WORLD-WIDE ATLAS of Modern Geography, political and physical, containing 112 plates and complete index. With an introduction by J. Scott Keltie. Second Edition. *W. and A. K. Johnston, Edinburgh and London, 1894. Price, 7/6.*

THIS is a revised edition of the Atlas published under the same title in 1892. It possesses those good qualities which always distinguish the work of Messrs. W. and A. Keith Johnson's painstaking accuracy of detail and almost infinite wealth of information. Some two thousand names have been added to the index, and the maps of the Polar Regions, Africa, and Central Asia show that the works of the latest explorers are carefully followed. To the historical student and the general reader who cannot afford to buy the Royal Atlas the book will be of great use; the teacher and student of geography will probably prefer a work which gives less information with more distinctness. In fact, to appreciate fully the accuracy and abundance of what is supplied, we have to examine the book with microscopic care. There are a few defects, which have only to be pointed out to ensure their correction in the next edition. For instance, in the inset map of the environs of Manchester there is no sign of the Dore and Chinley Railway, while portions of the city, such as Harpurhey, are shown as almost distinct and separate places; in the map of Palestine, biblical, classical, mediæval, and modern names are jumbled together without distinction; and in the map of the N.W. portion of the U.S. of America, sympathy perhaps with unfortunate investors has led to the alteration of Bear River (Utah) into Black River, while Brigham City appears more euphoniously as Brighton City. The introduction is an admirably condensed account of Geographical discovery, but it is a pity it was not brought up to the date of the second edition of the Atlas, as one might suppose that no fresh discoveries had been made in the interval, a supposition at variance with what is shown on the maps. There are other small matters which would doubtless be altered in a revision of the introduction, for the sake of clearness, the using the "seventh decade" as a correct way of denoting the years 70 to 79 or 80, and of such a passage as this: "*Under Nares the Alert and Discovery were sent out by Smith Sound by the British Government in 1875. It (!!) wintered in Lady Franklin Bay,*" &c.

GINSENG AND ITS CULTIVATION IN COREA.

A ROOT WORTH ITS WEIGHT IN GOLD—REGARDED BY THE CHINESE AS A PANACEA FOR ALL ILLS—UNDER THE GUARDIANSHIP OF THE TIGER, LEOPARD, WOLF, AND SNAKE—PROPOSITION TO CULTIVATE IT IN THE UNITED STATES.

[Communicated by Mr. D. A. O'GORMAN, of Boston, U.S.A., from *The New England Druggist*.]

THAT plant of myth and wonder, ginseng, is being experimented with by the Department of Agriculture. The newly-published annual report of Secretary Morton recommends its cultivation in this country. One million dollars worth of it used to be sent from the United States to China every year, but the quantity shipped has fallen off, owing to growing scarcity of the wild root. These facts, says the Washington correspondent of the "Boston Transcript," lend special interest just now to a description of the queer vegetable product, which is the chief article of export from Corea.

The Chinese, who consume nearly all of the Corean ginseng, regard the plant as a panacea for all ills of the body. They believe that the root possesses intelligence, and is endowed with powers of locomotion. Being anxious to escape capture, it runs away when it is sought after. It is guarded by the tiger, the leopard, the wolf and the snake, these animals having been appointed by the gods to protect it.

In 1882 the Chinese Empress Hui-tai-ho lay sick near unto death. A few trusty friends of hers made an expedition in search of ginseng into the province of Quantung, where the most valued variety grows. They secured some, though they were obliged to encounter many frightful dangers and terrors. The story of the quest bears fitting comparison with the tales of brave deeds done by the chivalrous knights who left King Arthur's Round Table to search for the Holy Grail.

Quantung ginseng is so rare and precious that search for it is only conducted under Government auspices. Adventurous spirits who volunteer for the quest are furnished with explicit directions and rations for a fortnight. It is said, whether truly or not, that most of them fall victims to wild animals, perish with fatigue, or succumb to famine in the mountain wilds where the plant grows. Now and then one of the seekers, who, like Sir Galahad, has a nature chaste and pure, is permitted at night to see the spiritual essence or halo which the divine and life-sustaining root puts forth. When day dawns the treasure is unearthed.

A root weighing three or four ounces sells readily for \$200. The quantity thus obtained is only a few pounds annually. This variety bears a wonderful resemblance in form to the figure of a man, which fact in itself proves its supernatural origin. Wild ginseng is sought on the mountains of Manchuria, where the grass is taller than a man. Searchers with sticks beat the grass on every side, until they find a patch of ground that is bare. They conclude that the plant they are after is below, and proceed to dig for it.

After the Quantung and Manchuria ginseng, the Corean root is considered by the Chinese the best in the world. In all treaties made by the Hermit Kingdom with the western powers a special provision forbids the carrying of any of the product out of the country. The sale and export of it are a monopoly of the Government. Nevertheless, great quantities are smuggled out in all sorts of ingenious ways. "Sam" is the Corean name for ginseng. Wild mountain sam is very rare, and worth its weight in gold. A single root has been known to fetch \$2,000. It is much bigger than any cultivated variety, sometimes a length of four feet.

It is said that ginseng seeds are planted in the mountains, and produce roots somewhat like the wild, though experts are able to detect the difference. The sale of such quasi-cultivated sam is regarded as a swindle.

The virtue of the plant does not lie in its material composition, but in a mysterious power appertaining to it through being produced wholly apart from human influence, under the care of a beneficent spirit. The mountain root is taken carefully from the earth, washed, gently scraped and sun dried. A whole one may be eaten at once. The person taking it becomes unconscious for three days, according to statements popularly accepted. He is sick for a month; then his skin becomes clear, his body healthy, and he lives free from sickness, suffering neither from heat nor cold, to 90 or 100 years.

Various nomadic tribes of eastern Siberia seek the mountain ginseng, and by its sale, with what they get for sable skins, make a living.

Chinese doctors are very cautious about prescribing the root for poor patients, inasmuch as it is supposed to be likely to do them harm or even to kill them, because they are not accustomed to the luxury. The upper part of the root is believed to have the most healing power. It is covered with rings, and the more numerous these are the greater the imagined age and market value of the specimen.

The ordinary Korean ginseng is cultivated on farms under Government supervision. Nearly all of it is raised in two provinces in the kingdom. Each farm is a rectangular enclosure, and has one or more little watch towers, in which a regular lookout is kept to prevent raids by thieves, who nightly might make off with profitable booty in a few handfuls of the roots. Near the entrance of the compound is a building in which sales are discussed and ginseng is inspected by the officials appointed for that duty.

The ginseng is not grown in the open air, but under sheds. The seeds are planted in the autumn. Every three days during their lives the plants are watered, and the beds are inspected to prevent ravages by insects. To keep out the light, mats of reeds or vines stitched closely together hang from the roof of each shed to the ground. In nature the sam grows in dark places. Seven years are required to rear the plants to maturity. In the fall of the seventh year the seeds ripen and are gathered. Immediately thereupon the harvest of roots begins.

The plants and roots are taken up carefully. If the latter are broken they will not fetch nearly so high a price. The stems are broken off, and the roots are washed, put in baskets, steamed, and finally dried on racks of bamboo poles in a drying house, beneath which are fire-places. They are packed for market in willow baskets lined with paper to exclude moisture. During the process of curing the roots turn red. They are about the size of a man's little finger, and when chewed have a mucilaginous sweetness. If good they will snap when broken. Much of the ginseng that comes to the Chinese market from America and elsewhere is "clarified"—that is to say, rendered translucent by steaming, skinning and drying the fresh roots.

The Koreans believe that ginseng is the best of all medicines. To say that to the Chinese it is what quinine is to Western peoples is hardly putting the case strong enough. In their country it is mixed with other medicines to form pills or decoctions, or else it is eaten dry. The various parts of the root are supposed to be adapted for different complaints—the "head" to eye troubles; the "body" to general debility; and the "arms" and "legs" to stomach disorders and colds. Nearly every apothecary in China has a sign advertising ginseng and young deer's horns pills. The latter are imagined to be a tonic.

The Chinese say that ginseng grows only among the immortals; honest druggists own that they have it not, but offer earth-grown substitutes to fill prescriptions. The medical science of the Western World does not recognise any virtue in the plant. The Chinese ginseng is of a species different from the American. The latter fetches \$2 a pound at Hong Kong. Korean ginseng is called "official ginseng," because it is one of the articles of tribute sent annually from the court of Corea to China. The plant is most famous for its supposed power to sustain life for a short period when the vital candle is flickering and about to go out. It is employed to a great extent as an aphrodisiac. The ginseng imported from the United States into China is rated as inferior to the Korean and about equal to the Japanese article. In Japan an odd method of protecting the ginseng roots from rats is adopted. Rats follow the holes made by moles and eat the roots. Bamboo tubes filled with gunpowder are placed in the mole holes and touched off. The fumes are said to banish the rodent pests. To keep off the larvae of insects, onions and radishes are planted in the ginseng beds. These attract the grubs, for the purpose of destroying which the vegetables are pulled up at intervals.

It seems strange that in parts of the world which are so widely separated as China and the United States similar ideas respecting the ginseng should be entertained. Some aboriginal tribes in this country have the highest respect for the plant, regarding it as a very powerful medicine. In the mountains of western North Carolina the Cherokees gather it. It loves moisture and the densest of forests which cling to the slopes of the hills, nestling in recesses where the rays of the sun never penetrate. These Indians call the ginseng the "Very Great Man," and, when they find a specimen, they repeat a formula taught to them by their priests, saying—

"O Mountain, I have come to take a piece from your side."

Then the finder picks up the plant and puts a glass bead in the hole to pay the mountain for it. The seventh plant found has special medicinal value, and the first four plants discovered must not be touched, though after others have been gathered the searcher may go back and collect those four.

LIST OF MAPS, BOOKS, JOURNALS, &c.,

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NOW IN THE LIBRARY.

With an indication of the maps, illustrations, and principal papers in the Journals.

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175. London. Proceedings of the Royal Colonial Institute. Vol. XVI. to XXIV. 1884-85 to 1892-93. (XXIV., 1892-93, Analysed).
176. London. The Geographical Journal, including the Proceedings of the Royal Geographical Society. January-August, October-December, 1893.
- London. Imperial Institute (see list of books).
177. London. Royal Gardens, Kew. Bulletin of Miscellaneous Information. Vol. for 1892. Nos. 73-84, January to December, and Appendix 1, 2, 3, 1893.
178. London. Royal Society of Literature. Transactions. Vol. XVI., Part 1. Afternoon Lectures on English Literature. 1893.
179. London. War Office Catalogue of Maps. Accessions. January-December, 1893.
- 179A. London. List of Maps, Plans, &c., of India and other parts of Asia, in continuation of Catalogue. Appendices, Nos. 6, 7, 8.
180. Manchester. Chamber of Commerce Monthly Record. Nos. 1-12, 1893.
181. Manchester. [Co-operative Wholesale Society.
182. Manchester. Transactions of Manchester Geological Society. Vol. XXII., Parts 3-13.
183. Manchester. Memoirs and Proceedings of the Manchester Literary and Philosophical Society. 1892-3. Series 4. Vol. VII., Nos. 1-3.
185. Manchester. Transactions of the Manchester Statistical Society. 1892-3.
186. Manchester. The Textile Mercury. Nos. 194-245. 1893.
187. Manchester. The Textile Recorder. Nos. 117-128. 1893.
188. Manchester. Report of the Union of Lancashire and Cheshire Institutes. September 30th, 1893.
189. Manchester. Journal of the Manchester Geographical Society. Vol. VIII., 1-12.
190. Newcastle-on-Tyne. Journal of the Tyneside Geographical Society. Vol. II., Nos. 3-4. 1893.
191. Newcastle-on-Tyne. Transactions of the North of England Institute of Mining and Mechanical Engineers. Vol. XLII., Parts 1-5; XLIII., 1. Annual Report, 1892-3.
192. Penzance. Royal Geological Society of Cornwall.
193. Salford. 44th Annual Report of the Museum, Libraries, and Parks Committee. 1891-92.
194. York. Yorkshire Philosophical Society. Annual Report for 1892.

ANALYSIS OF EXCHANGES.

Only the most important papers have been indicated. A very large number of smaller articles of great interest will be found on reference to the books themselves.

* The black figures refer to the number of the Journal in the preceding list, and the lighter figures the pages where the information will be found.

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 Practical Suggestions to Travellers, with diagrams. By J. P. Thomson. (190. 113.)
 History of Navigation between Europe and the East Indies. By E. Geleich. (11. 301.)
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 Chronological Table of the History of Cartography. By Dr. W. Wolkenhauer. (11. 319.)
 Question of Map of World of 1/1,000,000. By Prof. Penck. (7. 1.) (89. 108.)
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 Solution of the Martin Behaim Question. By E. Geleich. (102. 100.)
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 Maps of H. C. Gyger and J. Haller in the XVII. Century. By Dr. Graf. (7. 250.)
 Portulano attributed to A. da ca' Da Mosto. By A. da Mosto. (85. 540.)
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 (24. 54.)
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 Determination of the Speed and Direction of Cloud Movements, with diagrams.
 (Six sheets.) By Pomorzoff. (89. 217.)
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 Geographical Development of Coast Lines. By Prof. J. Geikie. (171. 794.)
 Permanence of Ocean Basins, with map. By H. R. Mill, D.Sc. (176. 230.)
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Pannaria Austriaca, with plate. By Dr. A. Zahlbruckner. (100. 438.)
 Skeleton of the *Uroplates fimbriatus*, with plate. By F. Siebearock. (100. 517.)
 On the *Ampulex* Jur, and Related Hymenoptera, with 3 plates. By F. F. Kohl. (100. 455.)
Phalaropus antarcticus and *Wilsoni*, with two tinted plates. By Dr. R. A. Phillippi. (91. 266.)
 On Characterless Eggs. By E. C. F. Rzehak. (100. 107.)

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- Constitutions of Governments of Europe. By Dr. C. Schanzer. (86. 47.)
 Geography and Architectural Monuments of Mediæval Europe. (66. 375.)
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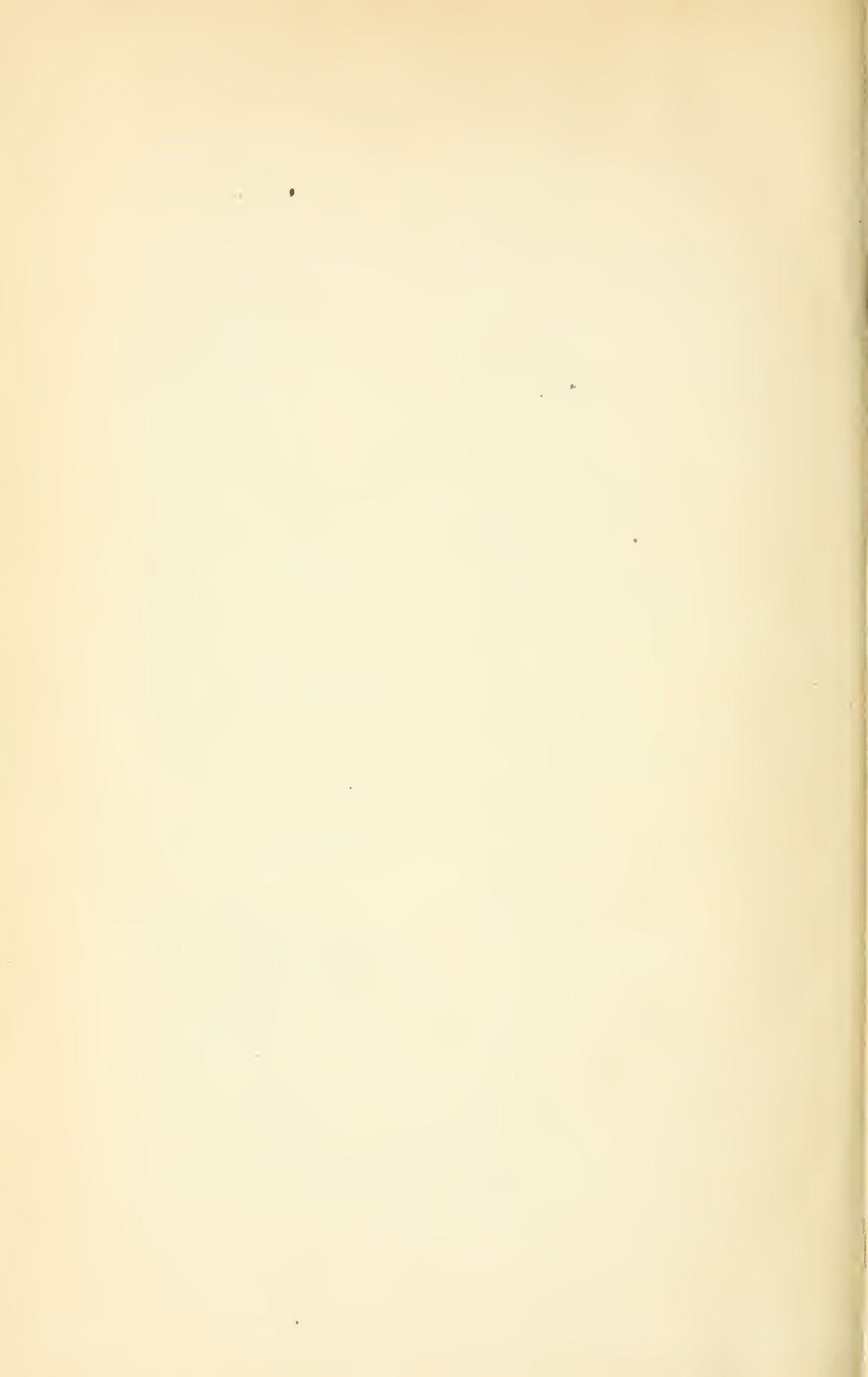
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